The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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A Successful Exhibition

WHATEVER may be the immediate or subsequent commercial results, the exhibition of British chemicals and dyestuffs at the British Industries Fair, whether considered as a spectacle or as an educational agency, may be pronounced at once a complete success. Two exhibits alone give to it a rare personal and historical interest, and convey to all but the completely unimaginative the essential meaning of the exhibition. These are a jar containing the original sample of "Mauve," the first aniline dyestuff produced in the laboratory of Sir William Perkin (exhibited by the British Dyestuffs Corporation), and a piece of silk dyed with the original "Mauve" dye produced by Perkin (exhibited by the British Alizarine Co.). These should recall with a really quickening effect the chance which a great British chemist's discovery first gave this country, the slackness with which the lead given by Perkin was allowed to pass to the industrious and practical German, the humiliating position of dependence for essentials of existence upon German enterprise which the war suddenly disclosed, and the serious efforts which are now being made to overtake the long handicap of past indifference. The last, of course, is the practical and vital point, and it is here that the exhibition is so encouraging. A large proportion of these British exhibits represent fine chemicals, dyestuffs, pharmaceutical and allied products which we were formerly content to buy from other nations rather than incur the trouble of making them ourselves. Not only are they being successfully produced in this country to-day, but they are already made in varieties and qualities which confidently challenge comparison with the best of other nations. The exhibition represents achievements in which the industry and the country may feel a real pride.

To assume from these successes that all has been done which the circumstances require would be merely to repeat our original mistake. To claim that in a few short years our young industries have reached a perfection which Germany required nearly half a century of constant effort to attain would be to put those industries themselves in a false position. What must be kept in mind is the excellent pace of our present progress, and the need of unslackened effort. Since already enough has been achieved to make retreat unthinkable, the only alternative is to go forward. And our chemical and dyestuff concerns are moving forward in a body. The exhibits show that, essential as the work of the great combinations is, it is not alone upon them that the industry depends. A pleasant feature is the number of comparatively small firms who are concentrating on special branches, holding their own against keen competition and paying their way on a sound commercial basis. The country wants large and small, competing, it is true, among themselves for business, but all the time working for the common welfare of British chemical industries. The exhibition itself is a demonstration of the growth of the collective spirit allied to individual effort. Already we are well on our way, and it is not the British habit to abandon jobs half-done. The moral of the exhibition is that we have already gone much too far to think of looking back.

Sulphuric Acid from the Contact Process

ONLY a fortnight since we noticed and discussed in these columns the special Report on the manufacture of synthetic phenol and picric acid at the national factories during the war. Reference was then made to the exceptionally practical manner in which the information gained from the opportunities which the demands of war provided had been collated and put on record for the benefit of private enterprise, and attention was drawn to the general satisfaction which prevailed when it was found that even "official" authors are capable of presenting facts in a manner which immediately appeals to the practical works manager. During the past week we have received a copy of the fifth Report, which deals exhaustively with

"The Manufacture of Sulphuric Acid by the Contact Process" (H.M. Stationery Office, pp. 129, 26s.). In this volume, again, one is struck with the meticulous care with which even the most insignificant process details are described. The range of subjects now covered must embrace processes of interest to a large proportion of the chemical community, and those who have made good use of the opportunities provided for augmenting their knowledge must feel that they owe more than ordinary gratitude to Mr. W. Macnab for the assiduity with which he has undertaken the arduous labour of putting such a plethora of scattered facts into a connected narrative. The only individual who can take exception to the reports is the one who is called upon to review or abstract them. Their substance, in fact, is of such homogeneity that it is almost impossible to light upon any particular portion and mark it down for special reference. One must take the information as a whole or leave it alone altogether, and the volume at present under notice is no exception in this respect.

As is well known, the early period of the war indicated that the demand for high explosives would involve the use of wholly abnormal quantities of strong sulphuric acid and oleum, quantities far in excess of the productive capacity of the country. Consequently, a number of plants had to be erected to produce sulphuric acid by the Contact Process. The first plants put down were operated on the Mannheim system, while at a later date a large proportion of the total output was contributed by plants (designed by Mr. K. B. Quinan) constructed on the Grillo System. The Tentelew method was also put in operation, but the report is mainly concerned with the first two. The distinctive characteristic of the Mannheim process is that the conversion of sulphur dioxide into the trioxide is brought about in two stages by employing two catalysts—ferric oxide and platinum, the use of ferric oxide diminishing the quantity of platinum required and thus reducing the capital cost of the plant. On the other hand, platinum alone is used in the Grillo and Tentelew processes.

One of the salient points in all processes is undoubtedly the effective purification of the gases before they come in contact with the platinum, for certain bodies—such as arsenic, selenium, and the halogens—even when present in small quantities, seriously impair or even destroy the activity of the platinum so that conversion of dioxide to trioxide may cease altogether. Purification is largely dependent upon the raw material employed. For instance, if sulphur is used it rarely introduces arsenic itself; nevertheless the catalyst may be poisoned by arsenic picked up from the iron used in the construction of the plant. Such problems and the manner of their solution are, however, discussed at length in the Report, and one can do little more than recommend every industrial chemist to obtain a copy without delay.

Two Points of View

THE critics of the Dyestuffs Licensing Committee opened fire on the President of the Board of Trade with more than their usual energy this week, but failed as usual to obtain from Mr. Baldwin more than the usual guarded replies, probably supplied by departmental prompters. He declined to institute an inquiry into the working of the Committee, retreated behind the safe defence that the complaints do not come from users, and generally expressed his confidence in the Committee's methods of discharging "a very difficult task." The weakness about all these complaints is that they concern mere details of administration, not unimportant, especially to the merchant class, but still details. They do not challenge the principle of the Act. That principle is that British dyestuff firms shall be protected for a period against foreign and especially German competition, and for that protection something, if need be, must be paid. Germany, especially at the present rates of exchange, could no doubt undersell British makers. It is the admitted purpose of the Act to prevent Germany from doing so. To pretend that such assistance can be offered to new British industries without causing anybody the slightest inconvenience is to set up an impossibly perfect case. Drawbacks there must be; they are the price to be paid in exchange for certain results.

The conflict, therefore, between Mr. Baldwin and his critics is not a difference about details, but a conflict between two opposite points of view. The merchant desires freedom to purchase without restriction in the cheapest markets, and is naturally annoyed that goods which could readily be sold in this country are not permitted to come in. The home manufacturer of dyestuffs just as naturally desires to limit competition which would close his recently established works. These positions are fundamentally antagonistic and cannot be reconciled. The governing fact to be remembered is that Parliament deliberately passed the Dyestuffs Act to meet the case of the British maker, and the Licensing Committee are clearly resolved to make it effective on that point. It is equally clear that they cannot do that and at the same time give the merchant free trade in dyes. That, as shortly as possible, is the present position.

The World's Potash Supplies

THE increasing sense of the importance of adequate potash supplies, especially for agricultural purposes, probably explains the issue of a revised and enlarged edition of Mr. Sydney J. Johnstone's monograph on "Potash" in the series on the mineral resources of the British Empire, prepared under the direction of the Mineral Resources Committee of the Imperial Institute (London: John Murray, pp. 122, 6s.). The statistics generally end with the years 1919 or 1920, though, in some instances, those for 1921 are included, and the prefatory note, signed by the late Lord Harcourt, is dated July, 1920. Even if not absolutely up-to-date, the work is nevertheless valuable as supplying a comprehensive survey of the principal sources of potash supply throughout the world. These are roughly classified into (1) solid deposits of soluble potash materials, (2) sea water, brines, and salt-lake deposits containing appreciable amounts of potash salts associated with sodium salts, (3) vegetable substances such as wood-ashes, beet sugar residues, seaweed and sunflower stalks, (4) animal material, such as wool washings, (5) products resulting from the decay of organic nitrogenous matter, such as Indian nitre, (6) dust carried in flue gases from the manufacture of cement and iron, (7) insoluble potash materials such as alunite, felspar, laucite, &c. Each of these sources is dealt with in detail.

Previous to the war the world's potash supplies were principally, of course, obtained from the Stassfurt

deposits, but the general shortage which followed when these supplies were cut off led to efforts to revive old sources previously considered unworkable on account of cost and also to discover possible new sources. Certain of these will probably only be utilised so long as the price of potash is high, but others, it is pointed out, such as those of Alsace, have already become competitors with the Stassfurt deposits. The figures as to the value of potash salts imported during recent years into the United Kingdom are interesting. In 1913 Germany easily headed the list in the matter of potassium nitrate with £156,682, followed by British India with £56,631, and Belgium with £25,023. In the following year the German figure had fallen to £92,058, and that for British India had risen to £109,145. For the last year in the table (1919) British India is the sole source of supply, £276,906, while in 1917 the value was as high as £839,191. In the matter of other potash salts, however, Germany retains the lead with £165,288 in a total from nine exporting countries of £613,665. The total imports of potash salts in 1919 amounted to £633,961, the highest figure since 1912, with the exception of £635,030 in 1916. These figures, of course, represent changes in values, and they do not necessarily involve corresponding changes in quantities. As regards exports of potassium compounds from the United Kingdom, the figures for the last year in the table (1919) show an immense advance over the preceding six years. Taking material manufactured in the United Kingdom, the value of saltpetre rose from £46,580 in 1913 to £151,023 in 1919, and that of chromate and bichromate of potash from £81,456 to £107,390, while the value of other sorts fell from £130,960 to £87,715. Under the head of foreign and colonial merchandise the value of saltpetre exported rose from £9,815 to £63,538, but that of other sorts declined from £71,948 to £45,570. The total output of potash (K_2O) in the United States is put down for 1920 at 48,077 metric tons.

Calcium Carbide Decision Confirmed

THE provisional decision which Mr. Cyril Atkinson, K.C., gave on February 6 upon the complaint by the British Cellulose Co. and others that calcium carbide had been improperly excluded from the dutiable list of articles under Part I of the Safeguarding of Industries Act, is now finally confirmed. The referee then deferred his official judgment to enable the complainants, if they thought fit, to raise certain points of law for further discussion. Apparently they have not considered this necessary, and on February 25 the provisional decision of February 6 was made absolute. The inquiry, it will be recalled, turned mainly on the question whether calcium carbide could be classed as an organic chemical. The expert witnesses being about equally balanced, the referee turned to the recognised text-books and appeared to be impressed by the fact that so many of them include calcium carbide in the inorganic section. Not only did the evidence fail to convince him that it had been improperly excluded from the list; it positively convinced him that it had been properly excluded. The Board of Trade view is therefore upheld.

The hearing of evidence in the prolonged inquiry relating to cream of tartar, tartaric acid, and citric acid was concluded on Saturday of last week, the referee, as usual, reserving his decision for a time.

Points from Our News Pages

In the third of our articles, "Leaders of Chemical Industry," a short sketch is given of the public work of Sir William Pearce, M.P., with some opinions on the importance of chemical industry (p. 266).

Our reports of the British Industries Fairs, opened in London and Birmingham on Monday, include a page of snapshots, an introductory sketch, and detailed notes on the various chemical exhibits (p. 269).

At the annual general meeting of the Institute of Chemistry on Wednesday the president (Mr. Chaston Chapman) reviewed the work of the year (p. 275).

The hearing of evidence in the Cream of Tartar inquiry was concluded on Saturday, the Referee deferring his decision (p. 277).

A description is published of an experimental plant at Langley Park for the neutralisation of sulphate of ammonia (p. 278).

Business, according to our London chemical market report, has expanded during the week, and the volume of trade now passing is greater than for some time past (p. 289).

In our Scottish Chemical Market report it is stated that the demand for industrial chemicals during the past week has been on a moderate scale, with steady buying for day-to-day needs (p. 291).

Books Received

COLLOID CHEMISTRY OF THE PROTEINS. By Professor Dr. Wolfgang Pauli. Translated by P. C. L. Thorne, M.A., A.I.C. London: J. and A. Churchill. Pp. 140. 8s. 6d. net.

ISOTOPES. By F. W. Aston, D.Sc., F.R.S., &c. London: Edward Arnold & Co. Pp. 152. 9s.

TECHNICAL RECORDS OF EXPLOSIVES SUPPLY, 1915—1918. No. 5: Manufacture of Sulphuric Acid by Contact Process. London: H. M. Stationery Office. Pp. 129. 26s.

THE CHEMISTRY OF COMBUSTION. By J. Newton Friend. London: Gurney & Jackson. Pp. 110. 4s. net.

A CONCISE HISTORY OF CHEMISTRY. By T. P. Hildich. London: Methuen & Co., Ltd. Pp. 276. 6s. net.

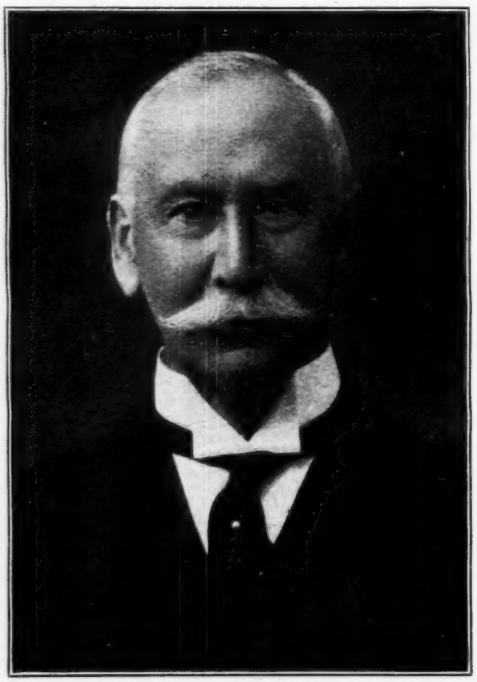
The Calendar

Mar.		
6	Society of Chemical Industry. Meeting. 8 p.m.	Burlington House, London.
7	Hull Chemical and Engineering Society: "Steam." A. W. Purchas. 7.30 p.m.	Wilberforce Café, Hull.
8	Society of Chemical Industry, Newcastle-on-Tyne Section: Lecture II. C. H. Desch.	Armstrong College, Newcastle.
9	Optical Society: Ordinary meeting or visit to optical works.	Imperial College of Science and Technology, London.
9	Society of Chemical Industry, Manchester Section. Annual Supper.	Textile Institute, Manchester.
9	Royal College of Science Chemical Society: "Some Weak Points in the Electrolytic Dissociation Theory." W. Jeffries.	Royal College of Science, S. Kensington.
9	Royal Society: "The Spectrum of Hydrogen." Professor T. R. Merton and Mr. S. Barratt.	London.
9	Society of Dyers and Colourists, Bradford Junior Branch: "The Franklin Dyeing Process." H. Winslow.	Bradford.
9	The Sir John Cass Technical Institute: "Recent Developments in the Glass Industry." Lecture III. W. E. S. Turner and S. English. 7.30 p.m.	Jewry Street, London, E.C.
11	Royal Institution: "Radioactivity." Lecture II. Sir E. Rutherford.	Albemarle Street, London.

Leaders of Chemical Industry

III.—Sir William Pearce, M.P.

THE interest of Sir William Pearce, M.P., in British chemical industry is both inherited and personal. The chemical works established in 1837 at Bow Common by his father, the late Mr. William Pearce, were among the earliest of the kind to be founded in London, and Sir William naturally became associated with them and in due course succeeded his father. These works witnessed the start of many important chemical industries in this country—sulphate of ammonia, superphosphates, tartaric and citric acids, &c.—and did much to supply the sulphuric acid required for these manufactures. Some twenty years ago the business was amalgamated with the well-known firm of Spencer Chapman & Messel, and for a considerable period Sir William was associated in the general management with Dr. Messel, one of the most distinguished chemists of his day, who, it will be remembered, left his fortune to the Royal Society and to the Society of Chemical Industry for public purposes. During the war the firm's production of sulphuric anhydride (oleum) proved of supreme importance, and this brought Sir William into close association with the late Lord Moulton in his important work on national explosives supply. Sir William presided over the last function at which Lord Moulton appeared—only a few days before his death—and it was on this occasion that they made the mutually interesting discovery that they had in their earlier days received instruction from the same schoolmaster, Henry Jefferson.



SIR WILLIAM PEARCE, M.P.

Apart, however, from these personal associations with chemical industry, the record of Sir William's own services, commercial and public, constitutes a sufficient claim to recognition. Elected to the House of Commons in 1906 as the member for the Limehouse Division, he was able as a private member to secure the passage of the Bill for the extension of polling hours—one of the most important measures ever recorded to the credit of a private member. Perhaps the most convincing testimony to his place in the House is the fact that he is so often referred to as "the member for chemical industry." In recent years chemical interests have occupied an exceptionally prominent place in Parliament, and probably no member has been so frequently consulted by the Government as well as by industrialists on all matters affecting the industry.

Among the many important projects with which Sir William Pearce has been identified, a few may be selected for mention. He was a member of the London County Council from 1892 to 1901, and chairman of the Bridges Committee during the construction of the Blackwall Tunnel. He also served for some years as a member and also as chairman of the Main Drainage Committee during the period when the problem of London sewage was so successfully treated by the removal of sludge and the purification of the river. He is on the Advisory Committee both of the Board of Trade and of the Department of Overseas Trade, and by special request he is at present sitting on the Committee dealing with Export Credits. Other offices held by him include those of Parliamentary Secretary to the Association of Chambers of Commerce, Vice-President of the Federation of British Industries, Treasurer of the Association of British Chemical Manufacturers, and Governor of the Imperial College of Science (on the nomination of the Society of Chemical Industry).

Reverting to Sir William Pearce's Parliamentary work, it should be mentioned that he is included in the Panel of Chairmen of Committees of the House of Commons, and has presided over many important committees, including the now famous inquiry into the taxation of war wealth. Lately he has been serving sa chairman of the inquiry into the question of the limitation of the percentage of carbon monoxide in domestic gas. Perhaps, however, the work most immediately bearing on the future of chemical industry was the part Sir William took on the Balfour of Burleigt Committee appointed to reporh on the future of essential national industries. This report supplied the justification for the passing of the Dyestuffs (Import Regulation Act) of 1920, and led later to the inclusion of fine chemicals in the Safeguarding of Industries Act of the following year. It is no secret that Sir William had a large share in persuading the Government that the passage of the Dyestuffs Act was imperative if the newly-founded dyestuffs industry was to be saved from extinction, and in urging upon them the claims of young British chemical industries to be safeguarded, at least for a time, against ruinous foreign competition. Sir William is too experienced a politician to adventure upon prophecies as to the future; he is content for the present with the fact, as he put it to us, that "the steps taken have preserved a vital national industry which must certainly have been swamped by unrestricted German competition but for the measures taken to prevent that disastrous result."

It is Sir William's opinion that the national importance of a completely equipped chemical industry can hardly be exaggerated. "The importance of such an industry," he remarked in discussing this matter, "should have been brought home to all of us by our experiences during the war, and to-day fortunately it is more widely recognised than ever before in the history of this country. We have had a Dyestuffs Act passed and fine chemicals included in the Safeguarding of Industries Act. But dyestuffs, after all, only form one part of the problem. The German synthetic organic chemical industry not only includes dyestuffs, but every intermediate and by-product has to find its proper value and right use. The chemical industry is not a simple matter. One may compare it to a mosaic, the plan of which, if you take out a few small pieces, may disappear altogether. Consequently the dyestuffs industry must and will depend largely on the success of the manufacture of fine chemicals and drugs.

"I do not think," he continued, "we fully recognise in this country the supreme importance of synthetic organic chemistry; the nation, in fact, is only just beginning to realise it. The Balfour of Burleigh Committee, appointed to inquire into the future of essential national industries, came to the unanimous conclusion that adequate supplies of dyestuffs, chemicals, and drugs were essential to national safety. They were persuaded to include fine chemicals and drugs with dyestuffs by the Report of the National Health Insurance Commission, and the long list of substances which are typical of what they included comprises salicylic acid, &c., salvarsan, novocaine, and phenacetin.

"Unfortunately, even now this country does not realise in the same degree as Germany does the vital importance of chemical industry. In Germany synthetic organic chemistry is regarded as the best and most valuable asset that Germany possesses, even superior in the opinion of some to the German steel industry. It is so regarded because they look upon it as their best hope of recovering their commercial prosperity, and perhaps their supremacy. While prepared to pay tribute to German chemical enterprise in the past, it follows that their chemical secrets are carefully guarded, and the most important processes reserved for the promotion of German interests. We are, therefore, forced to rely upon ourselves, and one of the most important duties of this nation is to appreciate, to a far greater extent than it has hitherto done, the vital importance to the nation of a thoroughly efficient synthetic organic chemical industry."

Is Shale Oil Profitable?

To the Editor of THE CHEMICAL AGE

SIR,—Replying to your correspondent, Mr. S. Williams, of the Fusion Corporation, Ltd., the question asked referred to any shale oil. The specific case stated answered the question in a specific way; the prices quoted are low for the locality of the deposit described. I endeavoured to point out that efficiency of operation is necessary for remunerative results, not only in shale oil, but in every other industry. It is safe to state that there is no industry that can exist to-day if it be conducted as the shale industries all over the world have been operated.

Now to answer the question in a general way, I will emphatically state that shale oil production is as profitable as any other oil industry when conducted in a scientific manner. Let us consider the large shale deposits of England, namely, Norfolk and Dorset, and deal with a very low grade shale, one with but 10 per cent. volatile hydrocarbons. It would be utter folly to attempt to retort such a shale, since at the most the oil production would not exceed 12.5 gallons per ton; yet this shale is a potential oil producer if properly treated.

The first process through which such a shale should pass is one of concentration. The concentration of a mineral like carbonaceous shale would not cost more than 1s. per ton, and shale with 10 per cent. hydrocarbon volatiles would concentrate 10 tons into one with a saving of 90 per cent., giving a ton of concentrates having a hydrocarbon volatile content of 90 per cent. This material would yield upon retorting between 195 and 200 gallons of oil per ton of concentrates. A much lower concentration might prove economical; it would depend upon the shale.

The shale oil industry must be viewed as a mineral proposition. No sane company would attempt to smelt a gold ore containing one-quarter of an ounce of gold per ton, yet many gold mining companies treat ore as low in gold as this, make large profits, and the cost of plant far exceeds that necessary to treat shale. I reiterate that shale oil is profitable and offers to investors a safer investment than one which undertakes the production of oil by boring holes in the earth's crust. If one-hundredth part of the capital which has been lost by the wild-cat operations of the oil drilling system had been spent upon the development of the known shale measures, the hole boring business would be relegated to the dust-heap of inefficiency.—Yours, &c.,

NAT. H. FREEMAN.

Willesden, February 27.

Reviews

A COURSE OF PRACTICAL ORGANIC CHEMISTRY. By DR. T. S. PRICE and DR. D. F. TWISS. Third Edition. London: Longmans. 1922. 6s. 6d. net.

This little volume, which has now reached its third edition, has undergone little change since its last appearance, the principal alterations being a slight modification in the preparation of acetamide and the substitution of benzoic acid for benzhydrol, as illustrating the Grignard reaction. In matter, in arrangement, in lucid description, the book leaves little to be desired and is deservedly popular. One word of general criticism may be offered. The selection of preparations includes the same series as has repeatedly appeared in previous text-books on this subject; there is scarcely a single preparation or method described here which is novel or which cannot be found in almost any volume on practical organic chemistry to which one has access. Why, among the hundreds of quite simple compounds derived from cheap materials, could not a few of them have replaced the old well-worn examples with possibly the addition of some useful but more elaborate preparations giving scope to the manipulative skill of the more advanced student?

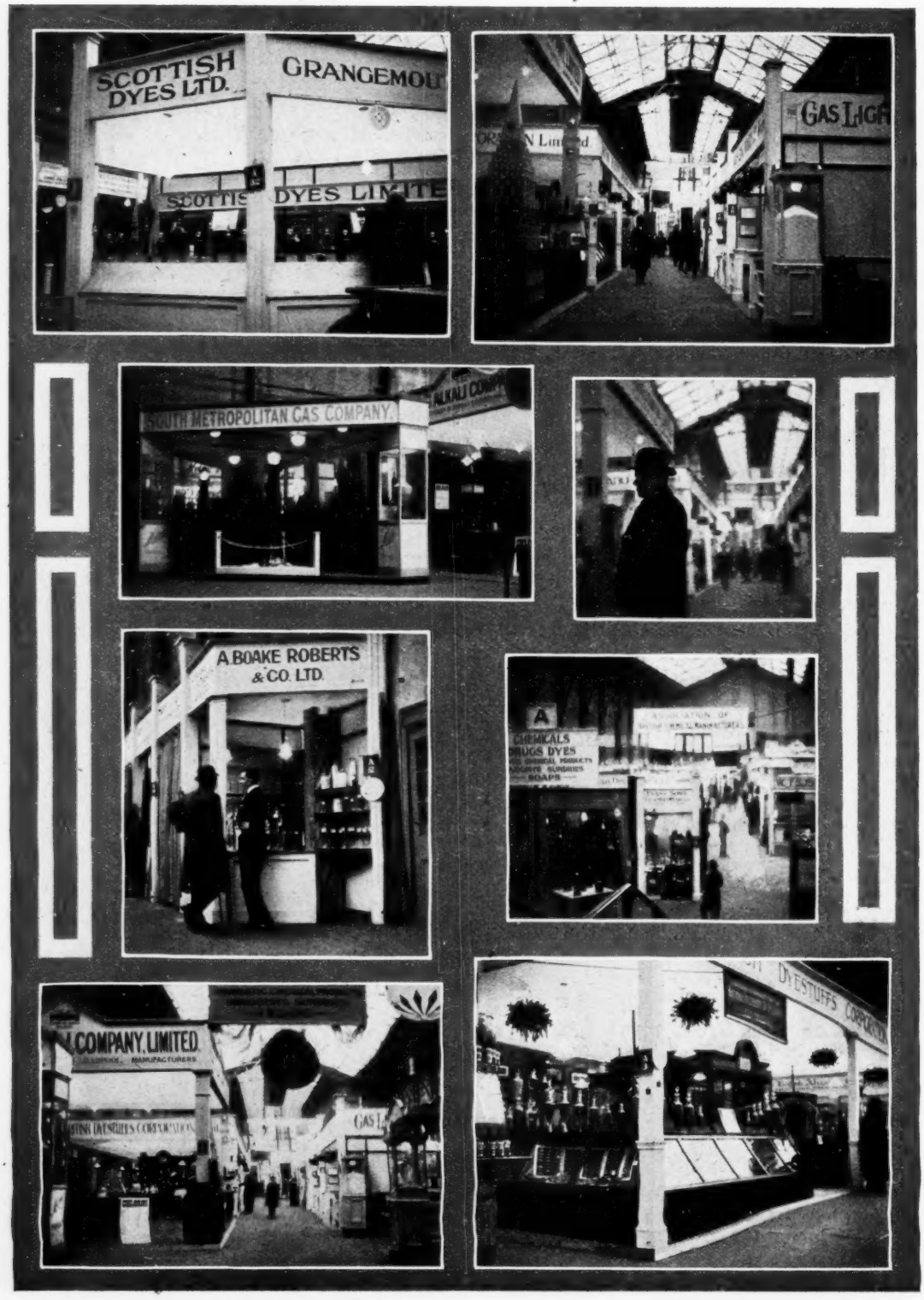
THE MECHANICAL HANDLING OF GOODS. By C. H. WOODFIELD. Pp. 116. PNEUMATIC CONVEYING. By E. G. PHILLIPS. Pp. 108. London: Sir Isaac Pitman & Sons. Each 2s. 6d. net.

These little volumes are among the latest editions to the comprehensive series of technical primers which is being published by Pitman's. The main object of the series is to bring out in as popular a manner as possible the fundamental principles of some subdivisions of engineering technology, to treat the subject in practical style, and to provide the student with a concise and handy survey of those branches of technology in which he is primarily interested. It is surprising what a great deal of really valuable information can be crowded into so small a bulk, and as examples of potted technics the two volumes under review are as good as any we recollect seeing. For instance, Mr. Woodfield has contrived to deal with practically all modern methods and equipment for the mechanical handling of goods, and he is able to supplement his theory with quite valuable illustrations with which he has been in contact in practice. He quite rightly prefaces his subject with considerations of a financial character; for, after all, the main object of machinery is to effect economy in operation. It is a pity, however, that the illustration chosen to show the basis of reckoning capital outlay justified is a poor one. So far as the engineering details are concerned we are taken through the range of all modern appliances from the manual types, such as rope tackles, to the latest forms of mechanical plant. A notable omission, however, is the electric telpher.

Mr. Phillips is on a popular subject with pneumatic conveying, for if this form of handling can once be perfected for all manner of comparatively dense, lumpy, and abrasive materials it bids fair to supersede the alternatives at present in common use. It cannot be gainsaid that the employment of moving air presents untold advantages as compared with the use of continuously moving parts made of materials of construction liable to fairly rapid depreciation. Flexibility is the *sine quâ non* of handling plant, and pneumatic methods offer a maximum of this essential.

There are still, however, many problems awaiting solution, and one is given to wonder whether it will ever be possible to deal with such materials as ores or extremely viscous substances. Albeit, progress within recent years has been remarkable, and the author concludes his highly engaging survey of the system by remarking that almost anything that will enter a pipe up to about 9 in. diameter can be conveyed either by "blowing" or suction, or by the induction method. M.

"C.A." Snapshots at the British Industries Fair



The British Industries Fair of 1922

Chemicals and Dyestuffs the Central London Feature

In 1915 the Board of Trade first organised a British Industries Fair for the benefit of manufacturers and buyers of certain classes of British goods, the aim being to facilitate the introduction of manufactures to buyers from all parts of the world. This fair was held in London and proved so encouraging that similar fairs have been held annually ever since. The fairs in 1916, 1917, 1918, and 1919 were confined to London, but in 1920 similar fairs were held simultaneously in Birmingham and Glasgow, to each of which were allocated special classes of goods more or less associated with the industries of the three centres. Similarly, in 1921, three fairs were held. This year the Glasgow Fair has been discontinued, as it was poorly supported, especially on the chemical side, which had been looked to for generous support. This year's London and Birmingham Fairs were opened on Monday last and will remain open until Friday next.

The chemical and dyestuffs section is admittedly the chief feature of the London Fair of 1922, which is being held at the White City. The exhibits occupy the large hall, to which the Shepherd's Bush entrance directly admits visitors, and the collective effect is at once excellent. No fewer than sixty stands are occupied with dyestuffs, fine and heavy chemicals, pharmaceutical products, and materials used in allied industries. The black and white scheme in which the decoration of the stands is carried out conveys a particularly bright and clean effect, which is well supported by an ample supply of natural and artificial light. The dyestuffs and colours themselves give a touch of brightness to the stands, while in the case of the finished textiles, feathers, yarns, silks, and printed cotton fabrics this is increased to a positive brilliance. Scarcely less attractive are the cases in which are seen samples of research chemicals, essential oils, the more refined coal tar by-products, and pharmaceutical preparations. Nothing nearly so good or so attractive had hitherto been brought together, and the 1922 exhibition will be remembered as a really creditable piece of organisation, and as a new starting point and standard in such matters. The Association of British Chemical Manufacturers is entitled to generous acknowledgment of its success in securing a collective effort by so many firms, and the individual exhibitors have done their part equally well in the arrangement and display of their products.

On the educational side no hesitation need be felt in pronouncing this year's chemical exhibition a complete success. It offers even to the casual eye the most convincing evidence of the advances made during and since the war in the production of dyestuffs, fine chemicals, and special preparations for most of which we were formerly dependent on foreign sources and some of which were even non-existent. At the same rate of progress another ten years should see British chemical industry developed almost out of recognition. As to the immediate commercial results, the effects cannot for the moment be so definitely traced. On the opening day certainly the exhibition was not overcrowded with buyers, but it is probable that improvement in this respect will be progressive throughout the duration of the Fair. The more immediate results, however, will probably be less than those to follow later. The main effect, after all, is the advertisement of British products, the introduction of possible consumers in the future, and those invaluable personal connexions on which business so much depends.

Reports received as we go to Press disclose a steady improvement in the daily attendance at the Fair, and the Overseas Department officers express their complete satisfaction with the results. Inquiries show a distinct advance on previous fairs, and in the Chemical Hall, we understand, some orders of considerable bulk have been booked, of which fuller particulars may be published later.

The event of the week was the visit of the King and Queen on Thursday morning. They arrived at the Shepherd's Bush entrance, and thus passed at once into the Chemical Hall. The visit was of a purely private character, and the public were not present. The Royal visitors, who both looked exceedingly well, were received by a party comprising Sir Philip Lloyd-Greame and other officers of the Overseas Trade Department, Mr. W. J. U. Woolcock, M.P., and others. They made a brief tour of inspection, and Mr. Woolcock pointed out to them the special features of interest. At the stand of the British Dyestuffs Corporation the King made several inquiries as to the progress of the dyestuffs industry in this country, and the quality of the dyes now produced. Taking out his handkerchief, he jocularly asked whether if it were dyed with B.D.C. dyes the colours would be liable to run. He was assured that it could be treated with colours as fast as any produced in Germany, and generally he appeared very much gratified to hear of the standard of efficiency already attained. The King and Queen passed on to the other departments of the Fair, and expressed their great interest in the exhibits. The visit was followed by an official luncheon at which the President of the Board of Trade and others spoke.

Wednesday next should also be an interesting day in the Chemical Exhibition. On behalf of the Association of British Chemical Manufacturers, Mr. Woolcock has organised a party of visitors for 10.30 a.m. Sir Philip Lloyd-Greame, the Parliamentary Secretary to the Overseas Trade Department, hopes to be present on this occasion, and a number of experts will be in attendance to answer inquiries.

The stands are described in greater detail on other pages. The largest is that of the British Dyestuffs Corporation, and it is very effectively laid out, but there are numbers of other colour and dyestuffs stands very well worth notice, such as those of the British Alizarine Co., the Southdown Chemical Co., Scottish Dyes, Ltd., L. B. Holliday & Co., the Graesser-Monsanto Co., and many others. The gas companies' exhibits are limited to two, but fortunately they are of the most representative character—the South Metropolitan Co. and the Gas Light and Coke Co.—and their products illustrate the high standard of efficiency to which the coal-tar by-products industry has been brought. In the field of analytical and research chemicals there are gratifying signs of progress, and the exhibits of British Drug Houses, Ltd., and other concerns sufficiently illustrate the good results of the efforts of the past few years. In heavy chemicals the largest stand is that of the United Alkali Co., but this again is supplemented by a very good range of exhibits by other firms. There is much of interest, too, in the sections set apart for disinfectants, fertilisers, insecticides, photographic chemicals, soaps, domestic chemical products, drugs and druggist sundries, and pharmaceutical and toilet preparations.

The Association of British Chemical Manufacturers have thoughtfully provided an information bureau, which has proved of considerable use to visitors, and Mr. W. J. U. Woolcock, M.P., the general manager, was, with Mr. E. V. Evans, among the earliest visitors on the opening day. It may be interesting to note that in the various announcements over the stalls the name of only one merchant firm appears, namely, that of Chas. Page & Co., as the sole selling agents of the Southdown Chemical Co.

The Fair will remain open up to March 10 daily from 10 a.m. to 6 p.m. It has been organised by the Department of Overseas Trade, and the Department has installed a special office where visitors can obtain commercial information. In addition an officer of the Department will be found in each section of the Fair.

Notes on the Chemical Exhibits

We give below short notices of the exhibits in the chemical section and hope to supplement these by further reports next week.

British Dyestuffs Corporation

The stand of the British Dyestuffs Corporation is a miniature exhibition in itself, representing not only the vast range of dyes now produced in this country, but their commercial uses in various British industries, and illustrating the continued progress of research in the production of new dyes. Furs, leathers, and almost every type of textile fabric are shown dyed with B.D.C. products, and the brilliant colourings make a very handsome display.

Beginning with indigo, it is interesting to note that the synthetic indigo dyes used for dyeing the goods on exhibition —yarns and cotton warps, &c.—are actually being produced in works formerly owned by a well-known German company in this country, the conversion being one of the achievements of Dr. Levenstein. In addition to the indigo-dyed goods, there is a series of cases containing dyed wrapping and blotting paper in a variety of shades, equal at least to the German range; woollens and tweeds; felts for slippers, hats, &c.; feathers, straws, and ribbons for millinery and other purposes; hosiery in cotton and natural and artificial silk; writing and printing inks; corduroy materials; jute, silk yarns, haircloth linen, &c.; and leathers of different qualities and makes in various shades.

While these results all look extremely good, a few sections may be singled out for special note. The Corporation are particularly well pleased with their fur bases. The quality of these is seen in some very good examples of goat skins dyed marten colour; bear and wallaby furs dyed skunk; kolinsky dyed sable, &c. This is a new industry in this country, and from the results obtained so far important developments are expected. Great advances, too, have been made in colours for calico printing, and some very attractive samples of printed cretonnes and similar fabrics are shown in the brilliant shades so popular in Eastern markets. Aniline colours for films, again, are regarded as an important section. This represents a considerable market, and the success already achieved promises well for the future.

A very large collection of samples of the actual dyestuffs produced by the Corporation is shown. In the important group of specially fast vat colours considerable progress is reported, and the samples include many formerly manufactured only in Germany. Lake colours, again, for paints, printing inks, &c., are a strong section, and attention is drawn to such samples as Monolite Fast Scarlet R, Monolite Fast Red P, Monolite Fast Red R, and Lake Scarlet 3 B. There are several examples of recently produced new colours, illustrating the steady prosecution of research; among them attention is attracted by one of the latest of the firm's successes—Brilliant Green Crystals Y.

Instructive posters are exhibited, showing the application of coal tar products to peace and war uses, and the Corporation's enormous output during the war in TNT, lyddite, dyed air rockets and light signals, mustard gas, &c.—all emphasising the importance of dyestuffs as a key industry. The need of emphasising this fact is strikingly illustrated by a small exhibit of exceptional scientific and personal interest. This is a small glass jar containing the first aniline dyestuff ever produced. It bears a label with the word "Mauve" in Sir William Perkin's own writing, and the jar is said to contain the original sample produced in Perkin's laboratory.

British Alizarine Co.

The adjoining stand of the British Alizarine Co. further illustrates the progress of dyestuff manufacture in this country. It is appropriate that almost side by side with the jar containing Perkin's original sample of the first synthetic dye ever produced should be exhibited a piece of silk actually dyed with the original "Mauve" made by Perkin. Equally appropriate is it, too, that the latter should be shown by a company who can boast of being the direct descendants of the first experimental works erected by Perkin at Greenford Green. These works were later removed to Silvertown, and subsequently enlarged and occupied by the British Alizarine Co., who have now once again moved on to Manchester for want of room to their fine new works at Trafford Park.

Already well-established before the war, the firm's operations have expanded four-fold or more in the period that has since elapsed and further extensions are confidently expected. The exhibits include alizarine and acid alizarine colours used in cotton-printing and wool-dyeing, chrome compounds for tanning, chrome alum crystals, chrome liquor, &c. We understand that in acid alizarine colours some very successful research work has been conducted, and among the more recent products are alizurol Green Y, Anthracene Brown, and Alizurol Blue Black. Samples of the firm's vat colours and alizanthrenes are shown, together with a small but convincing collection of samples of finished textile and leather goods produced by commercial firms using the Alizarine Company's products.

The manufacture of chrome compounds is a new branch of the company's operations, and the present demand for their chrome tanning compounds has for the moment exceeded the supply. Some very fine chrome alum crystals are shown. The new alizanthrene dyeings on cotton represent another new branch. These colours are identical with the German Indanthrene Series both as to quality and composition, and are of extraordinary fastness. The crystals of pure alizarine shown in one case are very fine, but they are not a commercial article; the price, in fact, would be about £1 per crystal.

United Alkali Co.

The range of this company's manufactures is so extensive that it is difficult to make a selection without omitting other equally important articles, which, either as raw materials or in the finished state, are of vital importance to British industries. Reference may be made, however, to some of the most important products such as sulphuric acid; caustic soda, soda ash and chloride of lime, all three of essential importance to the paper and textile industries, whilst caustic soda and soda ash are equally necessary for the soap and glass industries respectively; acetic acid for dyers, paint manufacturers, cotton printers; bicarbonate of soda for druggists, mineral water makers and foodstuffs; chlorate of potash for matchmakers; chloride of ammonium or muriate of ammonia for dyers, galvanisers, &c.; chloride of calcium for ice manufacturers; hydrochloric acid used to an enormous extent by galvanisers, wire makers, cotton printers, &c.; and sulphide of sodium for tanners and the dye industry.

In addition to these principal products which form the raw materials for the industries named, the company manufacture a whole range of intermediates for the dyeing and pharmaceutical industries in time of peace, and for the manufacture of explosives in time of war. Another branch of the company's activities is devoted to the supply of disinfectants such as chloride of lime, recommended by the Ministry of Health for the treatment of water supplies; chloros (a chlorine disinfectant) which has been used for many years by municipalities and public bodies throughout the country; and liquid chlorine the use of which is increasing steadily for the sterilisation of water. The company are the largest manufacturers in Great Britain of superphosphates and other fertilisers.

The domestic or household trade of the country is largely dependant on this company for the supply of materials such as salt, soda crystals and other cleansing products which form a special feature of the company's exhibit, which includes samples of all the products of the company in groups relating to various industries. Specimen packages of various kinds are also shown so that traders may see the actual containers in which various goods are supplied.

Another feature of the exhibit is a specimen of the apparatus by means of which liquid chlorine is applied to the sterilisation of water. An attractive touch is given to the exhibit by hollow columns fitted with glass panels shewing the various brands of the company's products, and by an ornamental centre piece which illustrates a few of the company's extensive works and gives some idea of its ramifications.

Southdown Chemical Co.

This well-known concern—one of the largest manufacturers of intermediates of the naphthalene series, such as Alpha and Beta Naphthol, &c.—have recently completed a large plant at their Birkenhead Works for the production of high-grade colours based on the Naphthalene Ring (which, by the way, is

their registered trade mark). Messrs. Chas. Page & Co., the sole sales agents of the company, have just issued a special brochure covering a very full range of products, and copies can readily be obtained by consumers. In this it is explained that in addition to the naphthalene colours, the company continue the manufacture of high grade qualities of coal tar intermediates of the naphthalene series. "The whole process of manufacture of the raw material to the finished dyestuff," it is stated, "is carried out in our own works, under scientific control; hence our clients may count on receiving dyes of unvarying quality at prices based on a minimum of handling and expert management, thus ensuring the most economical product on costs. Our research staff is always engaged upon the production of fresh colours of the highest quality, which will be added to our range when perfected, while our resources are always at the disposal of our friends for the elucidation of any problems which may arise from time to time in the dye-house."

As our readers are probably aware these works were started in 1915 to cope with the abnormal shortage in Beta Naphthol, and they have had a consistently successful career. It is interesting to note that in spite of the prevalent depression, the company express their optimism as to the future of the British chemical industry, and the fact that they have organised their special colour plant during the war is the best evidence of their complete faith in their own convictions.

The company's stand—simple but striking and good class—is distinguished by one unique feature—the announcement that the sole sales agents are Chas. Page & Co., of London, Manchester, and Glasgow, the only firm of merchant traders whose name appears in the chemical exhibition. Page & Co. have been the sole agents for the Southdown Chemical Co. in this country almost since their inception, and this is but one of the series of links in the chain of Mr. Page's policy of acting as sole selling representative of British firms manufacturing chemicals and coal tar products.

Scottish Dyes, Ltd.

Vat dyes are shown at the stands of the Scottish Dyes, Ltd., of Carlisle and Grangemouth, who specialise in this branch of dye manufacture, and who are now producing a range of about two dozen different vat colours. An interesting exhibit is a piece of material dyed with their Caledon Jade Green, which is said to be exceptionally fast and bright, and has not previously been manufactured in this country.

Caledon Red Bn is another interesting colour. Among the company's latest productions shown on the stand are the acid alizarine colours, Solway Purple and Solway Blue S.E. Carpets and mats on the floor are understood to have been dyed with the Solway colours.

South Metropolitan Gas Co.

The stand of the South Metropolitan Co., which meets the eye immediately on entering the hall, covers a wide range of coal tar distillates, intermediates, and inorganic chemicals. As one might expect, a prominent place is given to their sulphate of ammonia of the dry neutral, non-hygroscopic quality. The extremely fine and dry condition of the sulphate is shown by the ease with which it passes through an hour glass, a point of primary importance in distribution For commercially produced sulphate it has the very high analysis of ammonia 25·72, acid nil, moisture ·03. The demand for the company's product is such that production cannot keep pace with it, and further extensions of plant are contemplated. In the matter of intermediates the company have great potential resources, and they are only waiting for the much desired improvement in the textile trades to go vigorously ahead.

Gas Light and Coke Co.

This company, in addition to a sample of their high grade neutral sulphate of ammonia, show some neatly arranged cases of typical products such as naphthalene and carbolic acid, benzol, toluol, solvent naptha, cresylic acid, as well as a good collection of research chemicals. Pigment colours, too, are an interesting feature, and the Prussian blues of various shades can hardly fail to attract attention. The exhibit is a reminder of the very high condition to which gasworks by-products have now been brought.

British Drug Houses

One of the most distinctive exhibits is that of British Drug Houses, Ltd., since they represent a branch of chemical industry in which Germany was formerly as strong as we were weak, and since, moreover, their organisation for the production of fine chemicals—particularly analytical reagents and research chemicals—has been developed during and since the war. In several directions the firm have successfully replaced German makers. Already they have gained what is of essential value in such matters—a reputation for a high and dependable standard of purity and, as the result of research, have already been able to put many new products on the market.

Among the analytical reagents on view, mention may be made of dimethyl-glyoxime and benzyl-dioxime for delicate tests for nickel, hydroxylamine salts for testing and research work, and semicarbazide hydrochloride used for the identification of ketones, while other notable products are mandelic and glycolic acids used by biologists, and alanine and buiret used for culture media. Their standard stains for microscopy, pure and free from diluent, are another new feature, and one of which the company are reasonably proud, and for which, it is good to hear, there is a growing demand. The firm also specialise in intermediates of a specially pure quality for research purposes.

In a wide range of pharmaceutical products, attention may be directed to intramine, a recent production, and contramine, quite new, both valuable in V. D. treatment; sodium chaulmoograte, ethyl chaulmoograte, and ethyl margosate, used largely for leprosy in India; and barium sulphate, packed in exact quantities, of an extra pure quality for X-Ray diagnosis.

Mr. Tusting Cocking, whose recent article in THE CHEMICAL AGE on "Indicators," may be recalled, has arranged for the exhibition an interesting illuminated contrivance showing the range of each indicator.

L. B. Holliday & Co.

The stand of L. B. Holliday & Co., Ltd., is interesting for the new or recently produced dyes they are able to show, such as the eosine range of dyestuffs, which they are making on a commercial scale, almost if not quite alone; tartrazine, a new colour for foodstuffs, egg powders, &c., of a quality quite equal to German or Swiss products; acetyle rose, a new brilliant and very fast dye, largely used in the Bradford dress goods trade; brilliant alizarine green, claimed to be absolutely fast for suitings, &c.; and meta toluylene diamine, a new intermediate which, the firm state, was never made by the Germans of the same purity, and which is purified by a special process of their own.

J. W. Leitch & Co.

Another Yorkshire firm, John W. Leitch & Co., Ltd., show an interesting collection of organic pigments, oil colours, and intermediates. Before the war the firm were makers of intermediates, but since they have branched out into colours and dyestuffs generally—direct colours, acid colours (some especially pure in shade and percentage strength), basic colours, Bismarck Browns, and chrysoidines, and sulphur colours. In spite of the competitive conditions of to-day, the firm are able to expand, and they explain their success largely by the consistent standards they claim for their products. Organic pigments constitute an important part of their output, and they claim that they are even superior to German colours in purity and fastness to all agencies.

Hickson & Partners, Ltd.

An entirely novel series of sulphur black dyes, together with various fabrics dyed with these dyes, is to be seen at the stand of Hickson & Partners, Ltd., of 38, Well Street, Bradford. Known as the "Vidal Victory" blacks, they are claimed to be remarkably free from surface oxidation and free from bronzing on the selvedges of pieces. On the front of the stand are some fine specimens of the arrow-headed roseine (magenta) crystals. A satin cushion dyed with roseine is exhibited. Upon it rests a State Crown of roseine crystals. The metal foundation of the crown was immersed in a strong solution of the dye until it recrystallised. This exhibit is exactly the same as that shown in the Exhibition at South Kensington in 1862, when roseine was the only coal tar colour which was regularly produced on a commercial scale.

Mr. J. L. Rose

The stand of Mr. J. L. Rose, of Abbey Road, Barking, London, contains samples of gallic and pyrogallic acid manufactured at his own works.

A. Boake Roberts & Co., Ltd.

A Boake Roberts & Co., Ltd., Stratford, London, are showing their products on two stands. The former is devoted chiefly to a display of liquid SO_2, the cylinders being arranged in an interesting manner. On the other stand are to be seen chemicals manufactured by the firm for the perfumery, confectionery, brewing, mineral water, and varnish trades. A prominent feature of the exhibit comprises samples of phenyl ethyl alcohol, of which the firm claim to be the only manufacturers in this country; valerianic acid, and menthol. Terpeneless oils, flavouring essences, sulphites, amyl acetate, and solvents are among the products shown.

Bowdler & Bickerdike

The exhibit of Bowdler & Bickerdike, of Church, near Accrington, comprises standard tar products, specialised products, and articles of interest to the general public rather than to the chemical trade only. Their staple product, phenol, is naturally much in evidence in ice crystals, detached crystals, and liquefied. Cresylic acid in various grades, the 97/100 per cent. being the standard, is also shown. Among the specialised products are meta cresol and para cresol, which represent a new development of the business, meta-paracresol mixture, ortho chlorphenol, parachlorphenol, and nitroanisol. In the front of the stand is a glass jar containing carbolic crystals. Interest attaches to the jar as it was exhibited at the Paris Exposition in 1878.

Graesser-Monsanto Chemical Works, Ltd.

Three 90 gallon carbolic drums, painted a bright red, give a distinctive appearance to the stand of the Graesser-Monsanto Chemical Works, Ltd., of Ruabon, North Wales. On each side of the stand phenol detached crystals and phenol ice crystals are displayed in split 2 cwt. drums provided with a glass front. Acrosyl (British Lysol) figures prominently in the display, while samples of such products as ortho, para, and meta cresol, cresylic acid, pyridine, pitch, naphthalene, salicylic acid, saccharin, ortho-toluene-sulphon-amide, picramic acid, chlor-phenols (ortho and para) anisoldehyde, etc., are also to be seen. Specimens of wood treated with the company's brown wood preserving stain are hung on the side walls of the stand.

Gray's Dyes & Colours, Ltd.

Gray's Dyes & Colours, Ltd., of Grays, Essex, show alizarine colours; basic and direct cotton colours; nigrosines, &c.; intermediates; chrome liquors; and carbonate of lime. On the front of the stand is a framed cartoon (changed daily, we understand) in the Heath Robinson manner. One is entitled, "Making acid drops in a chemical works," and another, "Making alizarine from beetroots." The processes and plant are the direct opposite to those actually used by the firm, as will be seen from an inspection of photos of the Grays Works hanging up inside the stand.

Hopkin & Williams, Ltd.

Chemical re-agents are to be seen in great variety at the stand of Hopkin & Williams, Ltd., of 16, Cross Street, Hatton Garden, London. The specimens, which are attractively displayed, include potassium ferricyanide crystals; potassium cobalticyanide crystals; meso-thorium; uranium salts; sodium uranate; barium sulphate, &c. An interesting book of some seventy-two pages, giving standards and tests for analytical re-agents is available at the stand. The re-agents are given in alphabetical order, and in each case a description of the product is followed by an indication of the necessary tests and a description of trade varieties.

J. C. Oxley's Dyes & Chemicals, Ltd.

Among the latest productions shown by J. C. Oxley's Dyes and Chemicals, Ltd., of Lighthouse Chemical Works, Dewsbury, are their Brilliant Acid Rosamine G. & 2 G. colours. Dyed in an acid bath with the addition of 10 per cent. Glauber's Salts and 4 per cent. sulphuric acid at the boil, they are claimed to possess exceptional properties in the way of level dyeing, clearness of shade, and fastness to light. They are also used for shading chrome developing colours. The exhibit includes a wide range of acid, chrome, and direct colours, sulphonic acids, &c. Special electric light bulbs show dyed fabrics in their proper colours where artificial light is necessary.

May and Baker, Ltd.

At the stand of May & Baker, Ltd., of Battersea, London, is a representative display of mercurials, iodides, molybdates, scale preparations, ethers, glycerophosphates, &c. They show samples of potassium iodide in three different grades, of which the large crystals are especially fine. The range of scales, too, is of particular interest. A case in front of the stand contains samples of camphor of various sizes and stamped in a novel manner with the maker's name.

Orr's Zinc White, Ltd.

Orr's Zinc White, Ltd., of Widnes, have a tastefully decorated stand showing their product, "Orr's Zinc White." The variety of applications of this pigment is shown by samples, exhibited on the stand, from leading manufacturers in the paint, rubber, linoleum, and allied trades. Particularly instructive are the panels exhibited to show the advantages in covering power, colour, and opacity of Orr's zinc white against white lead and zinc oxide. Comparative demonstrations are given of the superiority of the product over other lithopones. This pigment is said to find favour in the rubber trade for vulcanisation purposes on account of its high breaking strain and elasticity.

Orr's zinc white was invented by Mr. John B. Orr in 1868, the founder of the firm. On the expiry of his original patent in 1884, the Germans placed on the market an imitation white under the name of lithopone. On approaching the stand one is attracted by the firm's trade mark, a rising sun, which is painted in gay colours with a well-known washable water paint maufactured from a base of Orr's zinc white.

James Robinson & Co., Ltd.

Sulphur dyes and fabrics dyed with these and other colours figure prominently in the exhibit of James Robinson & Co., Ltd., of Huddersfield. The sulphur dyes are shown in black, brown, blue, yellow, and maroon shades, while direct cotton colours are represented by materials in yellow, brown, blue, and black. Fast chrome blacks and blues are also prominent. The stand is of exceptionally attractive construction.

J. B. & W. R. Sharp, Ltd.

J. B. & W. R. Sharp, Ltd., of Lumb Chemical Works, Edenfield, Lancs., have a pleasing show on their stand of aniline dyes and intermediates, &c. Nigrosines, the firm's inaugural product, are well represented, and amongst an extremely varied array, a methyl violet is of more than passing interest. Among the newest colours to be seen at the stand are Azomine Fast Pink, and Fast Light Yellow. A patented lamp specially designed for the purpose allows the colours of dyed fabrics on the stand to be examined by an artificial light, which may, for want of a better term, be called synthetic daylight.

Williams Brothers & Co.

The exhibits shown by Williams Brothers & Co., Hounslow, include their old lines, nigrosines and indulines, and aniline colours for leather, foodstuffs, &c., wax colours, soluble in oil and turpentine, wood stains, boot polishes, &c.

Stafford Allen & Sons

Stafford Allen & Sons have an attractive stand of essential oils, in the distillation of which they may claim a long experience, terpeneless oils, powdered drugs and extracts, peppers and spices, scale preparations, almond and clove products, flavouring essences, expressed oils, &c.

W. J. Bush & Co

The main features of this firm's exhibit are synthetic fine chemicals, including perfumes, drugs, and intermediates, essential oils, flavouring essences, and food colours, esters of every description, salicylic acid and its derivatives. Among the interesting points is a case showing all the stages from natural cloves up to vanillin.

Acme Chemical Co.

Weed-killers and insecticides of various kinds are exhibited by the Acme Chemical Co., Ltd., of Tonbridge, Kent. Samples are shown on the stand of arsenite of soda, arseniate of lead, arsenical cattle dip, white ant poison, fruit-tree washes, quassia and logwood chips.

B. Laporte, Ltd.

B. Laporte, Ltd., of Luton, have an interesting exhibit comprising their various specialities in addition to a fairly wide range of miscellaneous chemicals. The company is perhaps best known in the trade in connexion with hydrogen peroxide in the manufacture of which they occupy an unique position. It is well known that barium peroxide is the chief raw material used in the production of hydrogen peroxide. As there was a great shortage of barium peroxide during the earlier part of the war, the firm commenced the manufacture of this product. They have developed this manufacture and their new works cover over 20 acres. It is interesting to note that they claim to be the only manufacturers of barium peroxide in Great Britain. In addition to barium peroxide, the firm make other barium products, including hydrate, sulphide, carbonate and sulphate. The exhibits include some fine samples of crystal and concentrated sodium sulphide made by a process used exclusively by B. Laporte, Ltd. Formic acid of all strengths up to 90 per cent., and sodium formate are also shown. One set of exhibits covers a number of articles especially intended for laundry use but which find application in other trades. Perhaps one of the most interesting of these is sodium perborate which the firm manufacture in large quantities.

Albright & Wilson, Ltd.

Compounds of phosphorus for all purposes are a prominent feature on the stand of Albright & Wilson, Ltd., of Oldbury, near Birmingham. Other interesting exhibits are ammonium persulphate, carbon tetrachloride (pure), and white and amorphous phosphorus.

Frederick Allen & Sons

Frederick Allen & Sons (Poplar), Ltd., of the Phœnix Chemical Works, Poplar, London, E. 14, show a large and comprehensive range of their products, which include pure research acids, inorganic salts, lead chromes and Ivy glues.

Alliance Colour & Chemical Co.

Manufacturers of aniline dyes and chemicals for the textile, leather, paper and paint trades, the Alliance Colour and Chemical Co., Ltd., have an interesting display of dyes and chemicals.

Boots' Pure Drug Co.

A very attractive stand houses the exhibits of Boots' Pure Drug Co., Ltd., of Station Street, Nottingham. Their fine chemicals, synthetic drugs, perfumes, soaps and toilet preparations are all tastefully displayed.

British Cyanides Co.

The British Cyanides Co., Ltd., 49, Queen Victoria Street, London, have a good show of their manufactures, which include yellow prussiates of soda and potash, carbonate and bicarbonate of potash, and permanganate of potash.

Burt, Boulton & Haywood

Coal tar and ammonia products and disinfectants figure prominently in the display made by Burt, Boulton & Haywood, Ltd., of Salisbury House, London Wall, London. Samples of sulphate of ammonia, benzol, toluol, solvent naphtha, heavy naphtha, crude carbolic acid, cresylic acid, pyridine bases, carbazole, creosotes of various grades, naphthalene (crude and refined), refined and dehydrated tars, &c., are shown. Among the disinfectants manufactured by the firm are "Silvertown" wood preservative; soluble creosote, carbolic disinfectant powders containing from 5 to 20 per cent., tar acids and special black compositions for all kinds of woodwork, stonework and metal work.

J. M. Collett & Co.

Sulphite and bisulphite of soda, metabisulphites, sulphurous acid, bisulphite of lime, Glauber's salt (B. P.), &c., are among the exhibits of J. M. Collett & Co., Ltd., of Gloucester, who also show caramel colouring and a variety of brewers' chemicals.

Pierson, Morrell & Co.

Aspirin, salicylic acid (B.P. and technical), acetic anhydride, lysol, sodium salicylate, and disinfectants are shown by Pierson, Morrell & Co., Ltd., of Queen's Road, Barnet, Herts.

Evans, Sons, Lescher & Webb

An interesting display of fine chemicals appears on the stand of Evans, Sons, Lescher & Webb, Ltd., of 56, Hanover Street, Liverpool, and of 60, Bartholomew Close, London. It includes samples of many of the drugs, pharmaceutical and toilet preparations manufactured by the firm.

Harker, Stagg & Morgan

C. R. Harker, Stagg & Morgan, Ltd., of Devon Wharf, Mile End, London, are making a special feature of their "Peldo" skin cream, a preparation for keeping the hands clean. Applied before dirty work it forms an invisible film which protects the hands against dirt or grease and is said to wash off, leaving the hands spotlessly clean.

Howards & Sons

Fine chemicals are the principal feature of the stand of Howards & Sons, Ltd., of Ilford, near London. Such products as aspirin, bismuth, salts, bromides, camphor, ethers, mercurials, and quinine salts are tastefully displayed.

Johnson & Sons

A stand reminiscent of the firm's offices at 23, Cross Street, Finsbury, London, contains a comprehensive range of the photographic fine chemicals made by Johnson & Sons (Manufacturing Chemists), Ltd. They manufacture all chemicals used for photography and cinematography, and the exhibit includes Metol & Amidol-Johnsons, glycin, pyrogallic acid, hydrokinone, paramidophenol, azol, &c.

St. Helen's Smelting Co.

Antimony products solely produced in the British Empire may be seen at the stand of the St. Helen's Smelting Co., Ltd., of 54, Mosley Street, Manchester, who are manufacturers of the A.S.P. Brand of antimony metal, which is supplied in standard cakes or broken or ground to 120 mesh if desired. They show a specially prepared black sulphide of antimony which is claimed to be free from the impurities generally found in the foreign crude antimony. The firm also show white antimony oxide, lactate of antimony, tetroxide (which is used when a higher specific gravity is required than that known as white oxide of antimony), and golden sulphide of antimony.

John Knight, Ltd.

Soap of every variety and grade is exhibited by John Knight, Ltd., of Silvertown, London. The exhibits include household laundry, perfumed, soft, medicinal, shaving, flaked and powdered and dye soaps, toilet preparations, glue, tallow edible oils and oil cake for cattle food.

Midland Tar Distillers

An interesting display of their manufactures is shown on the stand of the Midland Tar Distillers, of 43, Cannon Street, Birmingham, who manufacture, among other things, benzol, toluol, pyridine, carbolic and cresylic acids, refined tar, solvent and heavy naphtha, naphthalene, creosote, pitch, compound fertilisers and bone manures, disinfectants, weed killers and insecticides.

Thomas Morson & Son

Among the products to be seen at the stand of Thomas Morson & Son, Ltd., of 47, Gray's Inn Road, London, are bismuth salts, iodine preparations, glycerophosphates, chloroform, ether, hypophosphates, and pure phosphoric acid. Reagents and alkaloids are also shown.

L. Oertling

An automatic coin-weighing machine is seen in operation at the stand of L. Oertling, Ltd., of Turnmill Street, London, whose specialities include chemical, assay, and bullion balances, standard weights and measures, hydrometers, and saccharometers and petroleometers. They are showing a new balance with a fixed rider for weighing precious stones. It weighs from 1 to 500 metric carats. One exhibit is a balance for testing the percentage of moisture in butter, while one of their latest chemical balances (No. 31A) is also shown. It has a 13 cm. gun-metal beam to carry 100 grammes in each pan, turns with 0.1 milligramme, and is fitted with side-action.

Keeling's Oxides

Zinc oxide and manufactured products in which zinc oxide is used are found on the stand of Keeling's Oxides (1921), Ltd., of 35, Surrey Street, Strand, London. Chemical glassware (made by Duroglass, Ltd.), matches, rubber bath mats, and a number of other finished articles serve to show the wide application of the firm's staple product. Zinc dust and other metallic oxides made by the firm are also shown.

Thomas Tyrer & Co.

A comprehensive range of pharmaceutical and industrial chemicals is to be found at the stand of Thomas Tyrer & Co., Ltd., of Stirling Chemical Works, West Ham, London. They supply such acids as acetic, benzoic, chromic, hydrobromic, hydrocyanic, hypophosphorous, lactic, nitric, oleic, and tannic, in addition to bismuths, citrates, ethers, hypophosphites, mercurials, scale preparations, cobalt salts, iodides, and other fine and technical chemicals.

Whiffen & Sons

Emetine salts and preparations are among the specialities of Whiffen & Sons, Ltd., of Battersea, London, who are sole consignees of the Mysore Government sandalwood oil. Their products include iodine preparations, camphor, essential oils, theobromine and quinine salts.

The Birmingham Fair

FROM OUR OWN CORRESPONDENT

The Birmingham section of the British Industries Fair is this year of a very comprehensive character, though the entries are down compared with last year. They number 500, and there are 60,000 ft. of stands; but Midland industries are better represented than hitherto. This is due to the fact that a number of the largest Midland firms which have hitherto not appeared in the schedule are represented and they display an exceptionally wide range of manufactured goods. The Fair, indeed, affords a wonderful object-lesson as to the amazing diversity of Midland industries. The leading features are, as might be expected, the groups devoted to general engineering and to brass foundry and hardware; machine tools and the like occupy a large amount of space, as do also gas engines, lighting, and heating equipment (gas and electric) and there is a big section devoted to constructional engineering. Midland and other firms are represented by displays of motor cycles, cycles and accessories, and by sporting guns, &c. The schedule, enlarged this year, includes mining, colliery and quarrying machinery and appliances, and also equipment for the needs of agriculture, dairying and poultry keeping, brewing, distilling, and cold storage plant, and catering, &c. Of these the mining and allied industries are well represented. The closer application of science to industry is very marked. There are eighteen stands which will make an appeal to oil users, and it is worthy of mention that oil engines and stores receive most attention, and burning equipment and apparatus is a new feature. The displays of paints, varnishes, enamels, and the like are not quite so representative as usual. Prominence is given to protective coatings for various metals, and to the numerous by-products obtained in the manufacture of Mond gas. As last year the fair is held in the large aerodrome buildings at Castle Bromwich, which is close to Birmingham and easily accessible.

Overseas visitors on Monday were much impressed by the general high quality standard of the exhibits: there is apparently no desire on the part of the British manufacturers to produce cheap and shoddy goods, and acknowledgment was made by buyers of a more general willingness to produce precisely according to specifications. The Director of the Overseas Trade department states that week by week Continental and foreign buyers are more and more showing appreciation of the quality of British made goods which they want if only prices are not beyond their reach.

The Lord Mayor of Birmingham (Alderman D. Davis) presided at the luncheon, with the council on Monday, and expressed the hope that the fair would give a much needed impulse to trade, and Mr. H. O. Worrall, the chairman of the council (and a leather manufacturer) expressed the belief that commerce had touched the worst of the prevailing depression, and that the upward swing of the pendulum had commenced.

The display of chemicals products at the Birmingham Fair is not so large as last year, but it is nevertheless fairly representative. The SOUTH STAFFORDSHIRE MOND GAS COMPANY show a wide range of preparations, such as sheep dip, wood preservatives, stains and paints, obtained from the by-products of Mond producer gas.

FREDERICK CRANE CHEMICAL CO., LTD., Birmingham, made a representative display of celluloid lacquers and varnishes for preventing oxidation in metal work. They feature specially celluloid enamels in various colours for wood; it is sprayed on and can be rubbed up by hand with a soft velvet and finished by a polishing machine to give a lustrous effect. Bronzing mediums are also shown.

A wide range of industrial chemicals is shown by W. CANNING & CO., Birmingham. These include "Britewite" nickel salts used for barrel plating, and "Albo" nickel salts for general all-round nickel plating and for repair work. "Nivo" nickel salts are also prominently displayed; it is claimed for the latter that a thick deposit of nickel can be obtained in half the time occupied in an ordinary solution of double nickel salts. Lacquers giving effective finishes are also shown.

The HOCKLEY CHEMICAL CO. display bronzing and colouring solutions, zinc salts, and lubricants for the cutting tools of milling, planing, &c., and case-hardening compounds.

Celastoid is exhibited by the BRITISH CELLULOSE AND CHEMICAL MANUFACTURING CO., LTD. A new celluloid, it is non-porous, non-hygroscopic, and can be effectively worked on machines and jointed or welded with acetone solution and other solvents. It is claimed to be a good electrical insulator.

The DAMARD LACQUER CO., Birmingham, show a wide range of lacquers suitable for the metal trades, solutions for removing grease and traces of acid, and effective polishes for lacquered articles.

Carbonising compounds are exhibited by the CONTROLA ENGINEERING CO., LTD., Birmingham, who also, as agents, give prominence to anti-corrosive coating for steel work, &c., and to material for rendering concrete impervious to oils. A wide range of glues is sent by the CLAYTON GLUE WORKS, LTD., Manchester; these include carpet glue, opaque glue for paper-making, and non-acid and non-frothing glues, as well as a variety of Scotch glues.

Household cement in collapsible tubes, as well as a variety of varnishes, lacquers for brushing and spraying, and celluloid enamels are exhibited by the NECOL INDUSTRIAL COLLODIOUS LTD., London.

MORGAN, CROSSLEY & CO., Manchester, have a large display of wicks for oil lamps, and plaited wicks for candles and night lights, &c.

There is a wide range of asbestos specialities on the stand of BELLS' UNITED ASBESTOS CO., LTD., London, and the AEROGRAPH CO., LTD., have a complete working exhibit, demonstrating the advantages of applying colours, varnishes, lacquers, enamels, &c., by the spraying process. An interesting exhibit, too, is that of the METAL COLOURING CO. (Tucker & Knowles), of Birmingham, who show in operation the patented process of Roudelli and Sestini for coating steel and copper with a protective coating of oxide in an electrolytic bath. The colour can be varied from pale yellow to a blue-black.

Chas. Page and Co.'s Colours List

THE firm of Chas. Page & Co. announce that owing to the continued expansion of their business they have decided to issue a separate catalogue for their Colours Department instead of embodying it as a section in their general price list. Copies will be issued post free monthly to firms interested. The first issue, for March, covers a considerable range of colours, including acid, basic, direct, chrome and mordant, meta chrome, nigrosines, sulphur, and union, together with dye-house chemicals, materials for printing-inks, &c., and tannic acids.

In an introductory note it is explained that all the colours are offered for direct delivery from works in regular and consistent quality, the firm being, in the majority of cases, sole selling agents to the producing works. They disclaim any interest in "the jobbing business," and customers are assured of being able to obtain regular supplies of all colours in the same standards. Attention is being given, in the first place, to a restricted range of the highest grade British colours, which will be added to from time to time, and a point is made of matching samples or dyeings and of supplying special colours to buyer's specifications. For convenience in ordering, each class of colour is distinguished by a letter, and each separate colour has a distinctive number.

Institute of Chemistry

The President's Address at the Annual Meeting

At the forty-fourth annual general meeting of the Institute of Chemistry, held on Wednesday, the President (Mr. A. Chaston Chapman, F.R.S.) presented the first Meldola medal to Dr. Christopher Kelk Ingold. The medal, which is the gift of the Society of Maccabæans, has been instituted as a memorial to Professor Raphael Meldola, a past-president of both the Institute and the Society, and is awarded for meritorious original work in chemistry conducted by British subjects under thirty years of age.

The President's Address

In the course of his presidential address Mr. Chaston Chapman said that owing to a variety of causes—foremost among which must be placed the intensive educational effect of the Great War—the importance of chemistry to the national well-being was daily becoming more widely and more clearly recognised, and with that recognition had come a great development of the work of the Institute. The roll of members had increased during the past twelve months by 371 to over 3,540, and the students by 84 to 883. The organisation of the profession of chemistry was thus being steadily affected. The older members had the satisfaction of seeing the Institute placed on a sure foundation, and its position as the body truly representing professional chemistry in this country acknowledged alike by chemists, by the general public, and the Government.

Referring to the scheme recently inaugurated under arrangements made with the Board of Education for the award of national certificates in chemistry to students in technical schools in England and Wales, the President remarked on the advantage of bringing such students at an early age into touch with the professional qualifying body. Later, when the scheme was in operation, the Council would consider whether and to what extent the certificates should be allowed to rank towards the fulfilment of the conditions required for admission to the examination for the Associateship of the Institute.

In an open and comparatively young profession such as chemistry it was necessary that the public should understand clearly the nature of the work in which the members were engaged. He did not believe that any single cause had contributed so greatly to retarding in the past the progress of the profession of chemistry in this country as the misapplication of the word "chemist." In no other country was there any confusion between the person who practised chemistry and the person who followed the profession of pharmacy, and continental chemists often expressed their inability to understand what they no doubt regarded as one of our many national peculiarities. For the present the members had to be content to express the hope that their friends the pharmacists, without relinquishing their rights, would wherever possible refer to their ancient, important and very honourable calling by the word which more accurately defined and described it. The power—he might say, the tyranny—of a word was often very great, and he appealed to the Press, as a very important factor in the enlightenment of the general public, to assist, so far as it could, by employing the terms chemist and pharmacist respectively in the correct signification. It was to be deplored when such confusion was the unfortunate consequence of the poverty of a language; but in this instance the correct and distinctive words were readily available, and the confusion was therefore easily avoidable. If chemists themselves used the word without qualifying adjectives, it would be an effective step towards establishing the proper meaning of the word.

Work of the Chemical Profession

The war had proved a very powerful factor in informing the public of the activities of the chemical profession, which occupied a position in the public esteem such as he (the President) would not have thought possible in his own lifetime; but every member should help to the best of his ability to consolidate the position they had gained and to keep alive in the public mind the enormous national importance of the profession. Whether we regarded chemistry as a subject of study, essential to an understanding of the world in which we lived, as an agent which had done so much to transform the life of man, as one of the most powerful factors in the creation of material wealth, or, finally as that department of natural knowledge on which our national prosperity and our national security so largely depended, its supreme importance was equally manifest.

Commenting on the production of British laboratory glassware, porcelain and fine chemicals, the President said that the view taken by the Council of the Institute and by many others who were desirous of seeing those industries firmly established in this country was that it would be a mistake of the first magnitude to revert to the position of dependence on foreign—and possibly enemy—nations. The whole chemical industry (including those essential to successful conduct of war), the prosecution of scientific research, with all that that implied, and the practical teaching of science in schools and universities, all depended upon a supply of laboratory glassware, porcelain and chemicals, adequate in quantity, suitable in quality and reasonable in price. On national grounds it was obviously desirable that the country should be ever directing its activities to production and to the increasing development of its internal resources. There was, moreover, the further consideration, which was much in the minds of the Council, that the establishment of these essentially chemical industries demanded the services of properly qualified chemists. The British manufacturers had made great progress under difficult circumstances, and there appeared to be no good reason why we should not be self-supporting in all the requirements of the profession.

The Chemical Vocation

After complimenting the local sections of the Institute on their activity and acknowledging the help they had given to the Council in connexion with the work of the Institute, the President commented on the fact that, at a time of almost unparalleled industrial depression, less than 2 per cent. of the members were without employment. He thought they might draw from this the comforting inference that employers were looking more and more to science to help them in overcoming technical difficulties and in improving their manufacturing operations. He concluded his address, however, with a note of warning. Many parents still retained the impression that chemistry afforded a rapid road, if not to wealth, at least to a comfortable competence, and that it involved a less expensive course of preparation than for other professions. A keen love of the subject was essential to success; but those who were attracted to chemistry should be prepared to face a great deal of hard and often unattractive work and to make the very real sacrifice which a professional career inevitably involved. The course of training of the average chemical student was of a university character, and made the same demands upon the financial resources of parents as that for medicine and the law.

The present position of the profession should inspire its members with feelings of pride and deep satisfaction, and should stimulate them to increased endeavours to raise it still higher towards that position of pre-eminence which it was surely destined to occupy.

There was scarcely a department of human activity which was not influenced more or less profoundly by the discoveries and developments of chemistry, nor was there a single individual in the community whose comfort had not been increased and whose daily life had not been made happier—or at least more tolerable—through the beneficent operations of that science. What discoveries in chemistry the future might hold, and in what way those discoveries might still further modify the material life of man, none could say, but it was not unlikely that if any distinctive term should be applied by the historian of the future to the era on which we were now entering, he would describe it as the "Age of Chemistry."

Election of Officers

The report of the Council and the annual accounts were received and the officers and members of Council for the ensuing year were duly elected as follows:

President.—Alfred Chaston Chapman, F.R.S.

Vice-Presidents.—Horatio Ballantyne, Ernest Mostyn Hawkins, Sir Herbert Jackson, K.B.E., F.R.S., William Macnab, C.B.E., Andrew More, A.R.C.S., William Rintoul, O.B.E.

Hon. Treasurer.—Edward William Voelcker, A.R.S.M.

General Members of Council.—Walter Ernest Adeney, D.Sc., A.R.C.S.I. (Dublin), Edward Frankland Armstrong, D.Sc., F.R.S. (Warrington), Edward Richard Bolton (London), Alfred Archibald Boon, D.Sc. (Edinburgh), Arthur Jenner Chapman (London), Ronald Leslie Collett, M.A. (London), Allin Cottrell, M.Sc. (Oldham), Frederick George Donnan, C.B.E., F.R.S. (London), Lewis Eynon, B.Sc. (London), Francis Arthur Frooth, O.B.E., M.Sc. (Cheshire), Charles Alexander Hill, B.Sc. (London), George Nevill Huntly, B.Sc., A.R.C.S. (London), Patrick Henry Kirkaldy (London). Samuel Ernest Melling (Manchester), Gordon Wickham Monier-Williams, O.B.E., M.A. (London), Harold Moore, O.B.E., B.Sc. (London), Frederic Mollwo Perkin, C.B.E., Ph.D. (London), George Henry Perry, O.B.E., B.Sc. (London), James Charles Philip, O.B.E., D.Sc. (London), Thomas Slater Price, O.B.E., D.Sc. (London), William Henry Roberts, M.Sc. (Liverpool), Sir Thomas Kirke Rose, D.Sc., A.R.S.M. (London), Cyril Joseph Heath Stock, B.Sc. (Darlington), George Tate, Ph.D.(Liverpool), Douglas Frank Twiss, D.Sc. (Sutton Coldfield), Sir James Walker, D.Sc., F.R.S. (Edinburgh), Forsyth James Wilson, D.Sc., Ph.D. (Glasgow).

Censors.—Bernard Dyer, D.Sc., Sir Herbert Jackson, K.B.E., F.R.S., Gilbert Thomas Morgan, O.B.E., F.R.S., Sir Robert Robertson, K.B.E., F.R.S.

District Members of Council.—Robert Dexter Littlefield (Bristol and South-Western Counties), John Hanley (Liverpool and North-West Coast), Alfred Vincent Elsden, B.Sc. (London and South-Eastern Counties), William Marshall (Manchester and District), William McDonnell Mackey (North-East Coast and Yorkshire), Thomas William Drinkwater, L.R.C.P., L.R.C.S. (Edinburgh and East of Scotland), James Macleod (Glasgow and West of Scotland), George Rudd Thompson (Wales and the County of Monmouthshire), Alfred Godfrey Gordon Leonard, A.R.C.S.I., B.Sc., Ph.D. (Ireland).

Dyeing: Ancient and Modern

Progress in Vat Dyes

In his second lecture on the above subject, delivered at the Royal Institute on February 23, Professor Arthur G. Perkin devoted his observations to modern dyes and the methods of their application. It was (he said) interesting to consider the causes of the decline in the use of the natural dyes which had sufficed the world for so many thousand years. The advent of the first artificial dye, mauve, was soon followed by the production of other colours capable of yielding extremely bright shades hardly obtainable from natural sources. Those which found employment for dyeing purposes where durability was hardly essential did not at first materially affect the use of the more permanent members of the natural class, though as a result the handsome safflower red, turmeric yellow, and other fleeting dyes of this old group practically disappeared, at least from the Western world. More important, however, was the preparation of synthetic alizarine, which quickly superseded the employment of madder for turkey red dying on cotton, though its use as a wool dye was not at first generally appreciated. Though madder was now practically extinct as a dyestuff, our debt to it was great. The beauty and fastness of the shades which it yielded was the cause of the early examination of its colouring matter, and, as a result of this, to its synthesis. Matters, however, had not stopped there, for alizarine itself was now employed as a source of new dyestuffs for numerous chemical classes which had been of immense service to the community. Among these were alizarine orange, alizarine bordeaux, cyanin, alizarine blue, alizarine green, and others which possessed in general the same fast character as alizarine itself, and were considerably used for permanent effects both in dyeing and calico printing. By the aid of products which were employed in the manufacture of alizarine a host of dyes of extreme value of almost every conceivable shade were now prepared. Though these had again seriously affected the use of the natural products, the main blow to the natural dyes was caused by the discovery of the acid mordant colouring matters. The natural tendency in all dyeing operations was simplicity and economy, and more than ever was this the case at the present time when saving in coal, steam, water, and labour was obviously to be desired. The better natural mordant colours, though not greatly lacking in fastness, were as a rule not substantive to wool, the best effects being only obtained by a two-bath operation, which involved mordanting first and dyeing afterwards.

Acid Mordant Dyes

The acid mordant colours which were azo colouring matters containing usually both hydroxyl and carboxyl groups were substantive to wool, and were capable of dyeing this material, usually in the presence of a little acid. The shade thus obtained was not in many cases specially fast. When the dyeing operation was, however, complete, and the bath was exhausted of colour, the mordant, usually bichromate of soda, was then added, and on again boiling, the colouring matter became transformed into a chromium lake which was of a fast character. In this way an excellent result could be obtained by the use of one bath. It was also possible with metrachrome colours to add both mordant and colour to the same bath at the commencement of the dyeing operation with good result. These matters were so arranged that the colouring matter was taken up by the fibre before the mordanting operation commenced. For this purpose a preparation consisting essentially of ammonium chromate was employed.

An even greater simplicity in the production of many fast shades on wool with certain of the acid dyes was possible, and there were those which by merely dyeing in the presence of a little acid, without the use of a mordant, yielded shades of much beauty and of considerable permanence. Certain of these again could, if necessary, be mordanted also. Of importance among these were certain belonging to the alizarine group, of which alizarine saphirol, alizarine irisol, alizarine cyanine green might be taken as a type, and these latter were characterised chemically by the fact that, in addition to hydroxyl and sulphonic groups, the amino group was also present.

There was a boom in natural dyes during the war, and even those of inferior quality might still be purchased. Those which were yet found to be of real service, at least in this country and America, were now few and comprised logwood, still employed in very large amount mainly for wool dyeing, Old fustic, used for the same purpose in moderate quantity for mixed shades, Persian berries, which served as a yellow in calico printing, and catechu, which gave a very fast brown on cotton. Natural indigo also remained in use.

Recent Advances in Tinctorial Chemistry.

Perhaps the most important recent advance in tinctorial chemistry, said Professor Perkin, had been the discovery of new vat dyes, both of the indigo and anthraquinone series. Those formerly known consisted of indigo, indiarubber, and the now obsolete purple of the ancients. Until very recent years indigo was regarded as perhaps the fastest dyestuff known. Now, however, the superiority of indigo in this respect had been eclipsed, and many of these new vat dyes were much faster. Evidence of this would be apparent by a comparison of indigo-dyed cotton with that of the same material dyed with a colouring matter derived from carbazol, which was known as hydron blue. There were numerous ways of producing on indigo-dyed cotton a "discharge" by printing on such material usually a latent oxidising agent and subsequently rendering this active by means of acid. On passing the material into sulphuric acid, containing also in practice oxalic acid, chromic acid was liberated and the indigo was destroyed on the parts thus printed. But hydron blue, when dyed, was so fast that its discharge from the cotton could not be effected. With the exception of a bright fast red, almost any desired colour could be obtained from one or other of the vat dyestuffs. Thio-indigo red was exceptionally fast, and, indeed, it was possible, with this and many others of the vat colours, to destroy the material on which they were dyed without affecting the colour. An interesting property of the anthraquinone vat class, in contradistinction to the indigo class, was that whereas the latter, when vatted, formed yellow solutions, the former yielded highly coloured liquids. These leuco compounds had an affinity for the fibre, so that the material on leaving the vat possessed, at first, the colour of this reduction product. On exposure to air or, better, by the aid of a mild oxidising agent the true colour of the dye then developed. Full oxidation, however, took place somewhat slowly, and this was apt to be troublesome to the dyer who desired to ascertain from time to time if his material was up to shade. Though this group of vat dyestuffs included the fastest colouring matters known, their property in this respect differed and there were some among them which were rather fugitive to light. Some, however, were extraordinarily fast to light, soap, and even chlorine.

Close of the Cream of Tartar Inquiry

Foreign Witnesses' Evidence Challenged

THE concluding stage of this inquiry, so far as the hearing of evidence is concerned, was reached on Saturday, February 25, before Mr. Cyril Atkinson, K.C., the Referee appointed by the Board of Trade. It will be remembered that certain importers ask that cream of tartar, tartaric acid and citric acid should be taken out of the list of taxable substances issued by the Board of Trade on the ground that they are heavy and not fine chemicals.

Witnesses for the Opposition

Continuing the evidence for the opposition, Mr. T. Morson, the works managing director of T. Morson & Son, Ltd., manufacturers of fine chemicals for medicinal and technical purposes, explained that up to 1896 his company manufactured its own cream of tartar because it was unable to obtain it on the market in a sufficient degree of purity. They used tartaric acid and potassium carbonate as raw materials. When the present B.P. standard was introduced in 1896, however, his firm gave up the manufacture of cream of tartar. The term "fine chemical" had always had a very definite meaning to him and he had always regarded cream of tartar as a fine chemical. There were, however, many fine chemicals used for technical purposes.

SIR ARTHUR COLEFAX asked the witness to refer to any price list, trade catalogue, or trade journal in which cream of tartar was specifically referred to as a fine chemical.

MR. MORSON referred Sir Arthur to his own firm's catalogue, which said the firm were fine chemical manufacturers, and the list included cream of tartar.

SIR ARTHUR COLEFAX challenged the suggestion that every substance mentioned in the list was a fine chemical. The very next substance to cream of tartar was creosote. Was that a fine chemical?

MR. MORSON said it was. His firm were the original people who introduced creosote prepared from wood, and not from coal tar, for medicinal purposes, and the creosote in that list was a medicinal creosote and was a fine chemical.

THE REFEREE pointed out that in the list of Mr. Morson's firm quotations were given by the ounce, the gramme, and the pound.

MR. MORSON said that particular list only gave a very small portion of the firm's manufactures, and as to quoting a price per ounce, &c., that was a common practice in many articles even though they were dealt with in very large quantities. Cotton, for instance, was quoted by the pound; so was quinine and tartaric acid, although they might be sold by the ton.

THE REFEREE: Cotton is a very good illustration.

DR. E. H. TRIPP, who made it clear that he gave evidence in a personal capacity and not officially on behalf of the Society of Chemical Industry, was then called to explain the position with regard to the classification of chemicals in the abstracts in the Society's Journal. Down to 1909 there was a section of the abstracts headed "Fine chemicals, alkaloids, essential oils and extracts" (Group 20), and cream of tartar in most cases was put in that group, but not invariably, until 1909 from about 1882. He imagined that it could only have been placed there because the Publications Committee regarded it as a fine chemical. In 1909 there was a re-classification of the abstracts and the heading of Group 20 was altered, and although the heading of "fine chemicals" was not retained, these three substances were mostly put under the head of "acids and salts." There was no evidence to show why the heading of "fine chemicals" was discarded. The term was not a scientific one, and he did not regard it as a suitable one for classification purposes.

THE REFEREE: Then since 1909 your classification has been colourless for this purpose.

MR. JOHN LAUDER, partner in the firm of Andrew Kirkpatrick & Co., chemical merchants, Glasgow, said his firm sold large quantities of chemicals, both heavy and fine. They sold cream of tartar, tartaric acid, and citric acid to the textile trade and for other purposes as well. He had always regarded these substances as fine chemicals from as far back as he could remember, and they were kept in a place apart from the heavy chemicals in the warehouse. Among fine chemicals he mentioned potassium bromide, tartaric acid, citric acid, cream of tartar, sodium tartrate, saccharine, chlorate of potash and the aniline dyes, all of which were used for industrial purposes. As heavy chemicals he mentioned sulphuric and hydrochloric acids, bleaching powder, caustic soda, hyposulphite of soda, alum, &c. Most of these things were sent direct from the works to the consumer, but this firm kept emergency stocks in a place separate from the fine chemicals, although the same staff looked after both.

In answer to Sir Arthur Colefax, the witness said the principal reason why they were kept apart was to prevent contamination, because the fine chemicals had to be used for food and drug purposes.

THE REREREE: Then keeping them separate has nothing to do with whether they are fine or heavy.

LIEUT.-COL. KEMBALL, of Kemball, Bishop & Co., said he had had sixteen years' experience of the manufacture of tartaric and citric acid and Rochelle salts, and for the past seven years his firm had been making cream of tartar as well. In 1919 he went with the Mission which was sent on behalf of the Board of Trade to visit the tartaric acid factories in Germany, and he went over three of the large works there. At that time none of the factories was actually making cream of tartar, but he was shown the plant and had the processes explained to him. The works he visited were those of Goldenberg, Germont & Co. (Winkel); Benkiser (Ludwigshaven), and Bochringer (Neider Ingleheim), and from his knowledge of the manufacture of cream of tartar he came to the conclusion that the only purpose for which that plant could be used was the making of Rochelle salts as part of the process of manufacturing cream of tartar. The manufacture of tartaric acid and citric acid were being made in two of the factories he visited, and cream of tartar in none of them. There were chemists at the works, some in charge of the operations and some in the laboratory. There was a chemist in charge of the whole factory in the case of the two that were working, and chemists in the laboratory. He also saw chemists in the works, but whether they were there for the purpose of watching the operations or on their way to another part of the works he could not say.

THE REFEREE: As a matter of curiosity, did you learn anything there?

WITNESS: No.

You found that we know as much about these things as they do?—Yes, we do.

Foreign Witness Challenged

SEÑOR FERNANDO ESCALAS, of Barcelona, called by permission on behalf of the complainants, said he had been a manufacturer of cream of tartar for many years, and had had experience of the trade for twenty-five years. The process of manufacture was to place the raw material in vats having a capacity of 700 or 800 kilos, and after heating there was filtration, a quick crystallisation, and decolorisation. There was nothing else in the process and he did not employ any chemists. He denied that he had a large stock of cream of tartar which he could not sell because of the bad quality.

A number of questions were put to the witness as to his having had a conversation in London with Mr. Whitehall and Mr. Fry, of Kemball, Bishop & Co., and telling them that he had had a large consignment of cream of tartar rejected in the North of England, and also that the process he worked in Spain was a secret one. The witness at first denied any such conversation, but subsequently admitted that he might have been to the London premises of Kemball, Bishop & Co., but he had no recollection of whom he saw there, although he still denied that he said what was alleged.

MR. WHITEHALL gave evidence to confirm the question put to the witness. The conversation, he said, took place at a time when Señor Escalas was seeing him with regard to some raw material.

Cross-examined by Sir Arthur Colefax, Mr. Whitehall said he did not consider that Señor Escalas had described his process to the Referee, a remark which drew a somewhat heated reply from counsel.

SIR DUNCAN KERLY suggested that Mr. Whitehall was quite within his rights in saying that he did not believe a word Señor Escalas had said. In his view none of them knew what the process used by Señor Escalas was.

The proceedings concluded by addresses from the leading counsel, and the Referee reserved his decision.

Neutralisation of Sulphate

Results of Langley Park Experiments

A DESCRIPTION of an experimental plant for the neutralisation of sulphate was given by Mr. T. Johnson, B.Sc., at a meeting of the North of England Section of the Coke Oven Managers' Association at Durham on Saturday, February 25. Mr. A. H. Thwaites was in the chair.

Description of the Plant

Mr. Johnson said that the sulphate of ammonia plant at Langley Park was of the direct type. It was so fortunately situated, by reason of the battery carbonising nothing but dry coals, and the shortness of the gas main between the ovens and saturator, that for weeks on end in the summer months the saturator could be worked without the use of a super heater for keeping down mother liquor. The steam consumption was very low, consequently the method of neutralising which was best adapted to it, and probably to any other method of sulphate recovery, was one in which the amount of liquor to be evaporated or otherwise worked up was reduced to a minimum or, preferably, eliminated altogether. Considerable experiments were made at Langley Park in an endeavour to neutralise the sulphate by simply washing it with water in the centrifugal dryer, but in no case was it possible to reduce its free acid content to 0.025 per cent. with less than 2½ gallons of water per cwt. which would amount to a very large quantity of weak acid per day. Moreover, the contents of the centrifugal dryer as treated by that method were found not to be uniform throughout in their composition. Whilst portions of it were neutral, other portions of the same sulphate showed high acid content. For that reason the method was abandoned. The use of a weak aqueous solution of ammonia was considered, but the capacity of the pot still on the plant for working up ammoniacal liquor was below what was necessary to produce the required amount of ammonia solution. Further, the effect of free ammonia in solution upon the copper in the centrifugal dryer militated against the adoption of that method, which was also abandoned.

The question of providing sufficient ammonia by the decomposition of the sulphate of ammonia already made was next considered, but it was thought that having once got the ammonia in the form of sulphate of ammonia it was undesirable to break it up again. They therefore experimented with the use of finely divided alkali salts which, coming in contact with the free acids in the sulphate in its damp state immediately after leaving the centrifugal dryer, would bring about neutralisation. Precipitated calcium carbonate was tried in the laboratory and satisfied their requirements so far as neutralising was concerned. The problem of finding a suitable machine in which to deal with the whole of their make of sulphate on a commercial scale was solved after a certain amount of experimenting with a concrete mixing machine (which Mr. Johnson described by drawings). The machine was put into commission and dealt with the material quite satisfactorily. They also endeavoured to dry the sulphate before discharging it from the mixing machine by blowing hot air through it, but were unable to reduce the moisture content to the desired figure by that method. They then concentrated on finding a machine which would dry the sulphate at the same rate as it was discharged from the saturator. The merits of steam jacketed agitators, plates heated from underneath by gas or otherwise, a stream of sulphate falling down a tower through which a counter stream of hot air or gas was blown, and other forms of drying were considered, but none seemed suitable.

It was thought that the passage of a stream of hot air or hot products of combustion, horizontally, over a stream of sulphate, would bring about the desired result—in the same way in which crushed road metal was dried and heated before being treated with tar for macadamising. In their first efforts in that direction, a gas jet was burnt directly over the top of a stream of sulphate travelling along the bottom of a length of 24 in. gas main. This effort produced dense white clouds at one end and large pieces of partly decomposed sulphate of ammonia at the other end. Whilst that method was considered unsatisfactory it led them on the track of a solution of the drying question for them, at any rate. Instead of bringing the hot gases and the sulphate together in the method previously described, the gas jet was removed sufficiently far from contact with the sulphate to insure that dissociation would not take place. Staggered 3 in. angle irons were bolted horizontally to the inside of a revolving tube on the plant in 3 ft. lengths and the tube lengthened to the desired dimensions and finally they were able satisfactorily to dry the quantity of sulphate required per shift. By the method they adopted they were able to turn out sulphate of the following average composition: Ammonia, 25.4 per cent.; moisture, 0.2 per cent.; free acid, nil; calcium sulphate, 0.6 per cent. The amount of calcium carbonate used was 0.5 per cent. of the weight of sulphate of ammonia dealt with. The calcium sulphate in the finished material, they were informed, was in no way injurious for agricultural purposes. Calcium sulphate, however, having some of the properties of plaster of Paris, gave a tendency towards the formation of lumps in the sulphate produced. For that reason, and having regard to the fact that the cost of soda ash was only about one half of that of precipitated calcium carbonate, soda ash was substituted and found to give equally satisfactory, if not better, results than calcium carbonate. The analysis of the sulphate so produced was practically the same except that sodium sulphate was substituted for calcium sulphate. The soda ash used had the further advantage that its density was less than that of calcium carbonate. The bulk of soda ash necessary to neutralise a given amount of sulphate was therefore greater than that of calcium carbonate for the same purpose and it resulted in much better contact with the ash.

A measured quantity of sulphate as discharged from the centrifugal dryer was put into the mixer by means of a charging box; to that sulphate, whilst in motion, the requisite amount of soda ash was added. The ingredients were intimately mixed together for about ten minutes after which the neutralised sulphate was discharged and fed into the dryer by hand at the rate of about 6¼ cwt. per hour. The dryer revolved at about 22 revolutions per minute, at which speed the sulphate was carried up by the angle irons to the top of the dryer, thence falling through the hot products of combustion issuing from the gas burner at the discharge end of the dryer. The dryer was inclined at about 1 in 60. The motion of the revolving tube, together with the tendency of the angle of repose of the sulphate to decrease as the sulphate was dried, carried the sulphate forward to the discharging end of the tube, after which it passed over a small screen which took out any lumps over ⅛ in., the fine sulphate passing through the screen into a bag on the movable carriage beneath.

Main Features of the Process

The main features of the process were that neutralisation took place in an open vessel and that the drying was a separate operation carried out in another piece of apparatus and subsequent to neutralisation. The sulphate was filled directly into bags. The amount of gas required for drying had not been measured, but was less than what would pass through a 1in. diameter pipe at about 3 in. water gauge pressure. The gas flame was regulated so as to maintain a temperature of 300°C. at a point on the horizontal portion of the combustion chamber. In order to insure further that the sulphate should not come directly in contact with the hot gases whilst they were yet at a temperature sufficiently high to bring about decomposition, no angle irons were put in for a length of about 5 ft. at the discharge end of the tube, and the drying which took place in that part of the tube was only what was brought about by contact with its shell as the sulphate passed along the bottom. The temperature of the sulphate leaving the dryer was about 70°C. The man operating the machine from time to time squeezed a portion of the sulphate as discharged from the dryer in his hand and could tell approximately by its appearance after pressure whether or not it was sufficiently dry. If there were any tendency to cohere after compression it was not dry enough. If there was no such tendency and the sulphate passed freely out of his hand under compression, so far as they could see at present there was no danger of the sulphate forming lumps in the bags. Recent laboratory experiments had shown that with under 0.4 per cent. of moisture content in the sulphate, when either calcium carbonate or soda ash were used, there was no tendency to form lumps, even under a pressure so high as 110 lb. per sq. in. Above that moisture content, cohesion became pronounced. The products of combustion, together with the moisture from the sulphate, and pyridine, were carried away from the dryer by means of an overhead hood and chimney arrangement, and there was little or no smell as a result. The number of men required to work the neutraliser and dryer

was one per shift; his duty was to neutralise, dry, superintend bagging, weigh and sew up the bags. The output was about 6 tons per day. Unless some means could be found by which the sulphate could be more cheaply and satisfactorily dealt with than by the method described it was proposed to rearrange the plant in such a way that the man operating the plant would be relieved of practically all shovel work, which would enable him to perform duties other than those of attending to the neutraliser and dryer. They did not consider that they had overcome any great chemical or engineering difficulty, but they had, they thought, succeeded in fixing up a plant which would neutralise and dry the whole of their make of sulphate of ammonia satisfactorily and cheaply. They had for several weeks neutralised the whole of their output by that method and had sent several 100-ton orders in excellent condition. Mr. T. Westthorp had played a very prominent part in the experiments in connexion with the plant and had been of very great assistance in bringing them to their present stage.

In the course of discussion, the President said the plant described by Mr. Johnson seemed to be the most practical he had seen or heard of. After considering the question carefully he had not come to any definite conclusion, but was rather waiting for a plant which would do the whole three operations of neutralising, drying, and grinding in one.

Mr. A. E. F. Knott said that a paper on neutral sulphate had come at an opportune moment. The time was coming—or had come—when it would be as much a sin to send out the product containing moisture and lumpy portions as it was to send out benzol containing water and rust.

A discussion took place on the commercial aspect of the production of neutral sulphate.

Affairs of Bengol, Ltd.

At the offices of the Board of Trade, Carey Street, London, on February 24, statutory meetings of creditors and contributories were held in the liquidation of Bengol Co., Ltd., 1, Church Court, Old Jewry, London, when Mr. J. B. Thompson, Official Receiver, reported that the object of the meeting was to enable the creditors to decide whether they wished application to be made to the court for the appointment of a liquidator, other than the Official Receiver, and secondly whether they wished to nominate a committee of inspection. The company was registered in February 1919 with a nominal capital of £50,000, for the purpose of carrying on business as general merchants, also to acquire the goodwill and assets of the Bengol Trading Company, Inc. (U.S.A.). The company appeared to have carried on business from Gresham House, London, E.C., although the registered office was at Church Court, Old Jewry, E.C. The purchase agreement fixed the purchase price at £36,500 which was satisfied by the allotment of 36,500 fully-paid shares. There was no provision that the liabilities of the vendor company were to be taken over, but the company appeared to have assumed responsibility for an advance from a bank for about £80,000, outstanding at that time against stock taken over to the same amount. The company's business consisted of two branches, viz., chemical and textile, but the combined trading had proved unsuccessful. For the year ended December 31, 1919, a net loss of £12,422 was made, and in the following year the net loss amounted to £23,978. The total assets were estimated in the statement of affairs to produce £400 13s. 11d., but the Official Receiver said that was a very optimistic figure. The unsecured creditors claims for £3,684 were mainly for goods supplied. The cause of failure was attributed by Mr. H. G. S. R. Greene to trade depression and falling prices. The creditors decided to leave the liquidation in the hands of the Official Receiver.

Caking of Ammonium Nitrate

As difficulties appear to have arisen in Germany from the prohibition on the blasting of ammonium nitrate, mixtures of ammonium nitrate, and sulphate of the nitrate and potassium chlorate, the Prussian Minister of Trade and Industry has issued instructions framed with a view to preventing the hardening of these substances. The chief provisions are (1) that dumps should be kept as shallow as possible; (2) that wood should be kept away from nitrate stored in a loose state; (3) that the flooring and walls of stores should be of incombustible or unoxidisable material, such as clinker or asphalt; and (4) that empty cases, casks, sacks, &c., should not be left about.

Bentonite

To the Editor of The Chemical Age

Sir,—With reference to the interesting article on Bentonite which you recently published in The Chemical Age, I have

by this mail received a photograph from the owner, showing the outcrop of Bentonite on his property, which will no doubt interest your readers.—Yours, &c.,

F. Rushton Ablett.

20, Bucklersbury, E.C., February 27.

Safeguarding of Industries Act

Support from Chemical Manufacturers

At a meeting of the Chemical Manufacturers' Sub-section of the London Chamber of Commerce (Mr. D. Lloyd Howard presiding), held on Monday to consider the position of its members in regard to this Act, the following resolution was unanimously adopted:

"Whereas certain mis-statements have gained publicity in regard to the action of certain groups of merchants and dealers in the chemical trade in their opposition to the Safeguarding of Industries Act, and whereas the precise position of manufacturers has not been fairly represented thereon: resolved that this meeting of the Chemical Manufacturers' Sub-section of the London Chamber of Commerce, while agreeing with the attitude of strict neutrality towards the Safeguarding of Industries Act on the part of the Chamber as a body, regrets the false impression that has been created among the public and the Press that the Chamber has been opposed to the Act; further, that this meeting is of opinion that the Safeguarding of Industries Act is of great potential value, and records its conviction that the establishment in this country of a fine chemical industry is of the utmost national importance."

Peterborough Works Destroyed by Fire

Shortly after 2 o'clock on Thursday morning the Westwood Works of Joseph Baker, Sons, & Perkins, Ltd., Peterborough, were observed to be on fire. By the time the fire brigade arrived the fire had assumed alarming proportions, and despite all efforts to put it out, the works have been practically gutted. The offices and the new buildings, erected recently, are at present intact, but the damage to the remainder of the works is very considerable. Of the machine shops nothing remains but a tangled mass of metal. The cause of the outbreak is at present unknown, but it is rumoured that it had its origin in one of the paint shops. The works adjoin the Great Northern Railway on one side, but the delay to railway traffic has not been serious. As a result of the fire, it is feared that about 600 employees may be thrown out of work.

On inquiry at the head offices of the firm in London, a representative of The Chemical Age was informed that officials of the company left on Thursday morning for Peterborough, and that no estimate of the extent of the damage could be formed.

The Testing of Refractories

Paper by Mr. W. J. Rees

AN interesting paper on "The Testing of Refractories" was read by Mr. W. J. Rees, B.Sc., Tech., F.I.C. (Lecturer on Refractories, University of Sheffield), on February 23, before the members of the Birmingham and Midland Section of the Society of Chemical Industry. Dr. Brownsdon presided.

The Life of Refractories

The life of refractories used for the construction and maintenance of a furnace is dependant, Mr. Rees observed, on a variety of factors, of which the following are the most important: The softening temperature, the mechanical strength at normal and high temperatures, the thermal or reversible expansion, the permanent expansion or contraction, the resistance to abrasion and to slag attack, and the resistance to abrupt changes of temperature. There is a definite tendency to make greater use of specifications for refractories for various purposes. The conditions which the refractories have to withstand are being more precisely examined. The conclusive test is obviously the behaviour of the material under service conditions for it is desirable that tests should be available which will enable reliable deductions to be made as to the probable behaviour of a refractory under any particular set of conditions. The standard methods of testing proposed by the Refractories Section of the Ceramic Society are well known and widely used. It is, however, desirable that tests should be conducted under conditions which are as near to the conditions of actual use as is possible.

Tests on whole bricks are, in Mr. Rees' opinion, much more valuable than those on small portions of the brick. Better still is a test on a section of built-up brickwork but this is unfortunately beyond the resources of most laboratories. Chemical analysis is in general the first test to be conducted, and he recommended the methods suggested by the Refractories Committee of the Ceramic Society. Care must be taken in sampling the material. In sampling for analysis a delivery of fire bricks, at least four half-bricks should be taken and, after being reduced to 30-mesh size, mixed and quartered in the usual manner. Important as the chemical analysis is, it is by no means a sufficient guide to the behaviour of a refractory as it takes no account of the texture of the material—"texture" summing up the homogenity, extent of vitrification, porosity and the size and shape of the grains. For example, the mechanical resistance of a refractory to the abrasive action of hot dust-laden gases is mainly a factor of its texture, but its chemical resistance to the attack of the dust will be largely determined by its chemical composition. In regard to the determination of the softening or fusion temperature, he pointed out that in the standard test a representative piece of the material is chipped or shaped into the form of a cone about 1½ in. high. In his opinion, it was desirable to make the test on not less than three pieces. The type of furnace recommended was the Hirsch electric furnace, but he had found coal gas-fired furnaces quite satisfactory for the purpose. The test pieces are surrounded by seger cones and the temperature at which they bend over or squat is taken at the softening or fusion point; this point being deduced from the seger cone which bent down last. As to the rate of heating, it is important to measure the temperatures by a pyrometer in addition to the cone comparison and the maintenance of a neutral atmosphere. He had frequently tested the softening point of whole bricks by placing them on a refractory convex surface in a large gas-fired furnace and observing the temperature at which deformation of the brick occurs. In several instances the softening temperature of the whole brick has been 50°-150°C. lower than that indicated by the test on the small samples.

Whole Brick Tests

Regarding normal refractoriness on small test cones, Mr. Rees stated that the whole brick, when heated, deformed at 1,540°C., the rounded grog fragments sliding over each other as soon as the matrix of the brick became only slightly viscous. In the whole brick test the influence of furnace atmosphere can be better observed. In connexion with these whole-brick tests, observations had been made by various investigators as to the temperature of the exterior and interior of the brick. His own observations indicated a temperature difference of 20°C. with silica bricks, and 30°-40°C. with fireclay bricks after four hours' heating to 1,000°C. At 1,300°C. the temperature difference after eight hours' heating was reduced to 10°C. and 15°C. respectively. At 1,500°C. it is probable, therefore, that under the conditions of these tests the temperature of the brick is nearly uniform throughout. As to mechanical strength the cold crushing strength of fire bricks varies with the texture and extent of burning or degree of vitrification. The mechanical strength of fireclay bricks is much lower at high temperatures because of the gradual formation of a viscous condition in the brick. Mellor has shown that the sensitivity of a fireclay to load is the greater—the greater the alumina content of the clay—and, conversely, the sensitiveness decreases as the silica content increases. With ordinary coarse-grained silica bricks the loss of mechanical strength at high temperatures is much less than with fireclay bricks because of the greater viscosity of silica and saturated silicate melts. Very fine-grained silica bricks show a greater loss in strength than the coarse-grained unless they have been so well-burned that there is a good deal of re-crystallisation of the silica. Tests under load are preferably carried out on whole bricks, the load being applied by means of a lever system. The method of testing which he preferred was to apply a load of 50lb. per sq. in. to the brick and observe the temperature at which a definite degree of deformation has taken place. In a series of tests carried out by Mellor and Emery on twenty fireclay bricks of varying texture and refractoriness, the normal refractoriness varied from cones 26 to 33, whilst deformation was complete under a load of 50lb. per sq. in., at from cone 13 to cone 20 (1,380-1,530°C.). A simple method of applying the load test is to support a brick on its two ends, leaving a clear span of seven or eight inches, load it in the centre with a heavy brick on end, heat to 1,400° or 1,500°C., and observe the bend (if any) produced. This type of test is particularly useful in testing the strength of fireclay mixtures used in making glasshouse pots or steel melting crucibles. Regarding thermal or reversible expansion, he said results obtained indicated conclusively that in fire bricks containing free quartz, the thermal properties of the quartz are only slightly masked by the presence of the fireclay. The best tests as to after-contraction or after-expansion to indicate the volume changes which the brick is likely to undergo when in use at high temperatures, are carried out on whole bricks. Test pieces cut from bricks are liable to give contradictory results unless the material is quite homogeneous, and the burning uniform throughout the brick. The test he preferred was slowly to raise the brick to a temperature of 1,410°C. (cone 14), and maintain it there for four hours. In his experience bricks high in iron oxide and silica show a rapid contraction at 1,100°-1,200°C. A neutral or slightly oxidising atmosphere is specified for this test, but when it is known that a particular brick is to be used under reducing conditions then the test should be made under comparable conditions.

The resistance of a refractory to the corrosion of a slag, dust or ash, may be roughly determined by drilling a hole in the material, filling it with the slag or ash, and heating under predetermined conditions. It is, however, better to cement on to the face of the brick a clay ring, and fill this with the slag or ash, as the face or skin of the brick is not then removed. The lower porosity of the face of the brick may reduce the speed of the corrosion. The porosity of the brick is an important factor in the resistance to both abrasion and slag penetration.

A discussion followed.

Prevention of Accidents in the Claude Process

A WORKING difficulty that might have been anticipated in the synthesis of ammonia under pressures of 1,000 atmospheres and at reaction temperatures of 500°—550°C., as in the Claude process, is described by M. Georges Claude in *Comptes Rendus*. In the reaction between the hydrogen and nitrogen great heat is produced, and this was removed by the circulation of molten lead round the vertical reaction tubes. Accidents occurred, due to bursting tubes, and in this connexion it has been found that the crack starting the break in the tube invariably commences on the outside. The effect is shown to be due to the difference of temperature, about 200°C., between the inside and the outside of the thick-walled tube. This causes the warmer internal layers to exert an enormous pressure on the cooler outer layers, apart from the normal pressure of working. The tubes are now packed in kieselguhr to prevent this dangerous temperature-gradient, and other means will have to be adopted to remove the heat set free in the combination of the two gases.

Chemical Equipment for Kenya Colony

A SUGAR company in Kenya Colony have notified H.M. Trade Commissioner in East Africa that they are desirous of receiving quotations from United Kingdom firms for the supply of the equipment indicated in the following list, which they require for the chemistry department of a mill now in course of erection. The Trade Commissioner recommends that firms should send their alternative quotations for (*a*) the separate items, (*b*) the total equipment. The name and address of the inquirers may be obtained by firms interested on application to the Department of Overseas Trade, 35, Old Queen Street, London. The reference No. is 7980/ED/SC (2).

INSTRUMENTS :—1 polariscope (Schmidt & Haensch), No. 8868 ; 1 L. Oertling balance to weigh .001 gram. ; 1 bullion balance ; 2 boxes weights (.5—50 gm.) ; 1 box weights, 1—500 gm. ; 1 normal weight ; 3 milligram weights ; 1 box oz. weights, 1—20 oz. ; 1 polariscope lamp ; 1 400 m.m. tube ; 6 200 m.m. tubes ; 2 100 m.m. tubes ; 1 copper oven, 14 in. by 14 in. outside ; 3 pipe clay triangles ; 3 asbestos gauze ; 1 muffle furnace and double primus lamp ; 3 primus stoves ; 4 iron tripod stands ; 1 burette stand ; 1 set cork borers ; 2 German silver dishes with counterpoise weight ; 3 platinum dishes—two 1¼w by ⅝d, one 2½w by ¼d. PORCELAIN DISHES :—3 of 3½ in. diameter, 1 of 8 in. diameter ; 2 casseroles ; 1 spotting tile—shallow indentations. GLASSWARE :—1 specific gravity bottle with counterpoise weight ; 14 conical test glasses ; 35 funnels 3½ in. diameter ; 2 funnels 6 in. diameter ; 3 litre cylinders with stoppers ; 4 drop bottles with stoppers ; 11 glass cylinders 12 in. by 1½ in. ; 8 glass cylinders 8 in. by 1¾ in. ; 2 glass 100 c.c. cylinders, graduated ; 2 glass 50 c.c. cylinders ; 2 large desiccators 10 in. diameter ; 2 small desiccators, 5 in. diameter ; 5 litre flasks ; 5 500 c.c. flasks ; 2 1000 c.c. flasks ; 6 100—110 c.c. flasks ; 6 Bohemian glass approx. 250 c.c. ; 6 Erlenmayer conical flasks, assorted sizes ; 4 50—55 c.c. flasks ; 12 stoppered weighing bottles ; 4 burettes 50 c.c. ; 2 5 c.c. pipettes ; 5 10 c.c. pipettes ; 1 25 c.c. pipette ; 5 10 c.c. pipettes graduated in tenths ; 19 lighting jars ; 5 empty Winchesters ; 2 empty 2 gallon jars ; 4 polariscope lamp glasses ; 8 thistle head glass funnels ; 6 pairs assorted watch glasses ; 6 100 c.c. flasks, stoppered ; 6 100—110 c.c. flasks, wide neck ; HYDROMETERS :—6 each Brix spindles, 0—10, 10—20, 20—30 ; 3 brass Brix spindles, 30—90° ; 4 Centigrade thermometers, 0—110 ; 1 Centigrade thermometer, 0—100. CHEMICAL STOCK :—1 Winchester, hydrochloric acid ; 1 Winchester, nitric acid ; 1 Winchester, sulphuric acid ; 1 Winchester, acetic acid ; 2 lb. oxalic acid ; ½ lb. picric acid ; 15 lb. lead acetate ; 10 lb. litharge ; 1 lb. potassium permanganate ; ½ lb. potassium bichromate ; ¼ lb. potassium iodide ; ¼ lb. potassium bromide ; 1 lb. potassium chromate ; 2 lb. potassium ferro cyanide ; ½ lb. potassium cyanide ; 1 Winchester liquid ammonia ; ½ lb. ammonium nitrate ; ¾ lb. ammonium oxalate ; 2 lb. sodium hydroxide ; 7 lb. rochelle salt ; 1 lb. sodium carbonate ; 2 oz. barium chloride ; 7 lb. mercuric chloride ; 2 lb. alum chloride ; ¾ lb. silver nitrate ; 8 lb. copper sulphate ; 3 oz. phenol phthalein ; 2 oz. litmus ; ½ pint ether ; ½ pint cylol ; 1 Winchester carron oil ; 1 pint friar's balsam ; ½ lb. zinc sulphate. RUBBER TUBING :—2 ft. of ⅛ in. black rubber tubing ; 5 ft. of ¼ in. black rubber tubing ; 15 ft. of ¼ in. red rubber tubing, heavy ; 2 ft. of ⅜ in. red rubber tubing, heavy ; 1 dozen rubber stoppers, assorted sizes. MISCELLANEOUS :—1 set hand rollers ; 1 fibrator set up in fitting shop ; 1 bandage cloth ; Epsom salts, per cwt. ; disinfectant "Sanitas" ; zinc ointment, 10 lb. tins ; cough mixture powder ; castor oil, 5 gal. drums (medicinal) ; 2 pairs tongs ; 2 lb. animal charcoal.

Chemical Trade Wages Dispute

As no solution to the wages problem was arrived at, chemical workers in the Swansea district, with the exception of those at Pontardulais, came out on strike on Monday. It is understood that the Pontardulais works and others in the eastern area will stop next Monday, notices having been handed in this week. So far about five hundred men are affected. The National Council met in London on Thursday afternoon to discuss the position, but up to the time of going to press the result of the meeting is not known.

British Association Reprints

THE British Association is issuing a new series of reprints, beginning with a selection of communications given at the Edinburgh meeting in 1921. They are obtainable from the association's offices, Burlington House, Piccadilly, London.

German Potash Trust Development

WRITING from Berlin, a *Times* correspondent states that it has been announced that the Government of the State of Anhalt has sold to the Leopoldshall Chemical Factories its holding of 24,000 shares in the Salzdetfurth Potash Works for the sum of 90,000,000 marks [£100,000 at present rates]. The Leopoldshall Works belong to a combine dominated by the banking house of Hugo J. Herzfeld. Other reports state that the price paid was 112,500,000 marks [£124,000]. It is apparent from this deal, which is only part of a larger operation, that the formation of a great potash trust is in progress. The disposal of the Anhalt shares to this trust is viewed with misgivings by the Socialist press as tending to postpone indefinitely the existing scheme for nationalising the potash industry. It is doubtful, however, whether this small State, which held only a minority of shares in a single company, could have exercised the slightest influence on the question. Its position within the trust could have been made impossible. But the money realised from the sale of the shares will help to regulate the finances of the State, which, in common with nearly every other Federal State of the German Republic, are somewhat involved. The potash industry recently went through a crisis, but subsequently recovered. It will be remembered that the German Government, in reply to a question of the Reparation Commission, frankly admitted that the potash industry was capable of being developed to many times its present output. Presumably some such development is in view. The statement that the trust was being formed with the participation of foreign capital is denied.

Government Contracts

THE following were among the Government contracts placed during January :—

ADMIRALTY (CONTRACT AND PURCHASE DEPT.).—*Electrodes :* The Alloy Welding Process, Ltd., London, S.W. ; The Quasi-Arc Co., Ltd., London, E.C. *Water Coolers :* Heenan & Froude, Ltd., Worcester. *Candles :* Palmer & Co., Ltd., London, E. *Chemicals :* United Alkali Co., Ltd., Runcorn. *Soap, Hard :* E. Cook & Co., Ltd., London, E. ; Ogston & Tennant, Ltd., Aberdeen.

WAR OFFICE.—*Kerosene :* British Petroleum Co., Ltd., London, E.C. *Methylated Spirit :* Davis Brothers, Ltd., London, E. *Oils, Fuel and Gas :* British Petroleum Co., Ltd., London, E.C. *Oil, Lubricating :* Frank How & Co., Stratford, London, E. *Petrol :* Anglo-Persian Oil Co., Ltd., London. *Plant, Water Softening :* United Water Softeners, Ltd., London, W.C.

CROWN AGENTS FOR THE COLONIES.—*Castor Oil :* Premier Oil Extracting Mills, Hull. *Drugs, &c. :* Burgoyne, Burbidges & Co., London, E. ; Harker, Stagg & Morgan, London, E. *Gelignite, &c. :* Nobel Industries, Ltd., London. *Oil :* Huxley & Co., Liverpool ; Anglo-American Oil Co., Ltd., London ; Vacuum Oil Co., Ltd., London. *Oleum Terebinth :* J. Arnott & Sons, Newcastle-on-Tyne. *Paint :* Crown Composition Co., Swansea ; Torbay Paint Co., London, E.C. *Quinine :* Howards & Sons, Ilford. *Tar :* Shields & Ramsey, Glasgow.

Railway Rates (Esparto Grass)

ON Tuesday the Railway Rates Advisory Committee considered an application by the Paper Makers' Association for esparto grass to be placed in Class 8 of the General Railway Classification. The committee decided that it should be in Class 9, with a higher class for quantities under 4 tons. It was stated during the hearing that the railway companies are receiving correspondence which indicates that many traders are under the impression that the new classification comes into force immediately. Under the Railways Act of 1921 the final new classification will operate "from a date to be appointed." It will probably be from two to three years hence.

Sicilian Sulphur Production

WITH the object of increasing the Sicilian production and export of sulphur, the formation of a new company, on the lines of the old Anglo-Sicilian Sulphur Co., is reported to be contemplated. The sulphur production of Sicily rose from about 120,000 tons in 1860 to nearly 540,000 tons in 1905. The output dropped to 181,000 tons in 1919, and increased by 39,000 tons the following year. Exports during 1918-19 and 20 were respectively, 230,869 tons, 147,755 tons, and 190,175 tons.

Chemical Matters in Parliament

Research Work on Indigo

Mr. Woolcock (House of Commons, February 17) asked the Secretary of State for India whether the research work on the cultivation and extraction of natural indigo in India, which had been carried out with such conspicuous success during the past five years, had been discontinued and the Indian research chemist was to return home.

Mr. Montagu said he had received no information to this effect. The question of policy was one for the local authorities to decide.

Publication of Reports

Mr. Hogge (House of Commons, February 20) asked the President of the Board of Trade whether the Reports of the Committees under Part II. of the Safeguarding of Industries Act would be published, and whether, in the event of a disagreement, the majority report would be accepted.

Mr. Baldwin said the Reports would be presented to Parliament and published in the ordinary course. It would be the duty of the Board of Trade to consider the Reports, and due weight would be attached to any disagreement.

Price of Scheduled Chemicals

Dr. Murray (House of Commons, February 20) asked the President of the Board of Trade if he were aware of the statement made before the Referee that the day following the publication of the list wherein santonine was included, and subject to a duty of 33⅓ per cent., the wholesale dealers increased their price by 30 per cent.

Mr. Baldwin said he was aware that such a statement had been made, but he would point out that in a number of instances the prices of chemicals had fallen since the Act was passed.

Duty on Gas Mantles

In reply to Mr. Kiley (House of Commons, February 20), Mr. Baldwin said the duty on certain parts of gas mantles had not been put into operation as the Referee had agreed to state a case for the consideration of the High Court, and in the meantime the award had not been signed. He could give no idea as to when a conclusion would be reached.

Reparation Dyestuffs

Replying to Lieut.-Col. Willey (House of Commons, February 20), Mr. Young said the total weight of dyestuffs received by this country from Germany by way of reparation up to December 31 last was 4,070 tons, in respect of which approximately £570,000 (or £140 a ton) was credited to Germany; 2,400 tons had been sold for approximately £381,000 (after the deduction of expenses of realisation), or £228 a ton.

Manufacture of Iodol

In reply to Mr. T. Thomson (House of Commons, February 20), Mr. Baldwin said that so far as he was aware Iodol was not manufactured in this country, but was a German product consumed here on a very small scale.

Chemicals Delayed by Customs

Mr. Myers (House of Commons, February 21) asked the Financial Secretary to the Treasury whether he was aware that a parcel containing chemicals for research work was despatched from Berlin on December 17, addressed to Mr. Garfield Thomas, University of Manchester, which arrived at Grimsby on December 24; that he was informed by the Customs three weeks later that the goods had arrived and that the duty on the same would be 28 per cent. *ad valorem* duty and another 33⅓ on, which was immediately paid; and whether, in view of the fact that these goods were on February 9 still retained by the Customs despite the duty having been paid, he would have inquiries made as to the reason they had not been released.

Mr. Young said he was informed that the parcel in question was sent forward to the addressee on February 11. The delay in this case was regretted, but he was strongly of the opinion that the allegation that there was general delay for which the Customs were responsible was not substantiated by the facts.

Settlement of Disputes

In reply to Mr. Kiley (House of Commons, February 23), Sir R. Horne said no additional Referee had been appointed to consider objections which arose under Section 1 (5) of the Safeguarding of Industries Act. The Lord Chancellor had appointed Mr. Gerard M. T. Hildyard, K.C., as Referee to determine any disputes arising under Sections 1 (4), 10, or 11 of the Act. Payment of Mr. Hildyard's fees would be made out of the Vote for the Customs and Excise Department, but, so far, no fees had been paid.

British Cellulose and Chemical Manufacturing Co.

In reply to Mr. Kiley (House of Commons, February 23), Sir R. Horne said 1,450,000 7½ per cent. cumulative preference shares in the British Cellulose & Chemical Manufacturing Co., Ltd., were allotted to the Government under an agreement dated February 28, 1920. The circumstances under which the Government accepted these preference shares in replacement of advances made during the war had been fully explained in the House. No dividends had yet been paid. The Stock Exchange quotation on February 21, 1922, was 3s. 9d. to 4s. 3d. A salary of £500 per annum was paid by the Government to each of the two Government directors.

Zinc Concentrates

Sir W. Mitchell Thomson (House of Commons, February 21) submitted, on behalf of the Board of Trade, a supplementary vote of £601,200 to meet the estimated balance of expenditure over revenue in respect of certain contracts between the Government and the Australian Zinc Producers' Proprietary Association. The losses on concentrates to date had been £590,000 and those on spelter £2,200.

The vote was opposed by Sir Cecil Lowther, Captain Elliott, Messrs. Betterton and Wignall, and, on a division, was carried by 167 votes to 79.

Lieut.-Commander Kenworthy (House of Commons, February 28) asked the President of the Board of Trade whether the Government made grants of money or advances or loans towards the cost of the erection of a factory at Avonmouth for converting zinc concentrates into spelter and similar purposes; how much money was found by the Government; what were the circumstances; whether the factory was now operating; how much of the money advanced or paid had the Government recovered; and what had become of the remainder.

Mr. Young said that under an agreement of May, 1917, an advance of £500,000 was made to the National Smelting Co., Ltd., towards the cost of erecting such a factory, to be worked in conjunction with an adjoining Government factory, for roasting concentrates and for manufacturing sulphuric acid. The company's factory was not now operating, and no recovery had so far been found possible. The advance was secured by debentures under a trust deed, and the agreement provided for repayment being made from a sinking fund created out of a proportion of the profits in each year which would otherwise be available for distribution or dividends.

In reply to further questions by Mr. Haydn Jones and Mr. H. Jones, Sir W. Mitchell-Thomson said he was unable to state whether or not a loss would finally result from the purchase by the Government of Australian zinc concentrates. Regarding the arrangements made for the disposal of Australian zinc concentrates purchased by the Government for a period of ten years after the conclusion of the war, the following arrangements had been made. In respect of resales in Australia and east of Suez, the Zinc Producers' Association (Proprietary), Ltd., acted as agents for the Government. In respect of resales in Europe and all countries west of Suez, The British Metal Corporation, Ltd., had been appointed agents. The remuneration payable to the agents varied according to the services rendered, and varied from 4 to 5 per cent. on the business passing through their hands. No separate salaried staff was employed by the Government.

Part II. Orders

Mr. Baldwin (House of Commons, February 27) informed Mr. G. Terrell that, although Part II. of the Safeguarding of Industries Act had been brought into operation, no orders had yet been made.

Dyestuffs Advisory Committee

In reply to Mr. Raffan (House of Commons, February 27), Mr. Baldwin said that he had no reason to suppose that there was any serious dissatisfaction among dye-users generally with the operation of the Dyestuffs Advisory Licensing Committee, on which the dye-users were strongly represented. The committee discharged a difficult task with great care and ability.

Census of Production

Replying to a question by Mr. G. Locker Lampson (House of Commons, February 27), Mr. Baldwin said that the census of production proposed to be taken next year would be postponed as recommended by the Geddes Committee.

Kelham Sugar Beet Factory

In reply to Mr. Royds (House of Commons, February 22), Sir A. Boscawen said the present financial position of the sugar beet factory at Kelham gave cause for anxiety. Owing to the high cost of erecting the factory, the company exhausted their capital by the end of last year, and they applied to the Government for permission to borrow a further amount up to £200,000 in priority to the second mortgage held by the Government, and for a remission of the excise duty on home-manufactured sugar. The application of the company was referred to a special committee, which recommended that the company's proposals should not be agreed to. The Government decided to act on the report of the committee, and the directors of the company were considering the whole position. The Government held £250,000 in shares in the company, and had also advanced a loan of £125,000 on a second mortgage, subject to a prior charge of £40,000 for cash advanced by the company's bankers. The Government had also guaranteed a dividend of 5 per cent. per annum on the 250,000 shares subscribed by the public for the ten years ending March 31, 1930, but this guarantee would cease if the company went into liquidation or ceased to manufacture sugar.

Cream of Tartar Inquiry

In reply to Mr. Kiley (House of Commons, February 27), Mr. Baldwin said he could not give the approximate cost of the proceedings of the cream of tartar inquiry. So far as the Board of Trade were concerned, the only costs incurred (apart from the fees of the Referee) were the fees of one junior counsel representing the Board and the cost of the shorthand notes. No officers of other Government Departments had been present.

Carbide of Calcium

Replying to Mr. Kiley (House of Commons, February 27), Mr. Baldwin said the Board of Trade were not requested to withhold the name of the British Cellulose & Chemical Manufacturing Co., Ltd., in their application for an order to impose a duty of 33⅓ per cent. on imported calcium carbide. The Board of Trade briefed only one junior counsel, though the complainants and others interested briefed leading and junior counsel; no solicitor's charges were incurred by the Board of Trade, and no expert witnesses were called or paid by them. There were ten sittings of the Referee in all. He was unable to state the total cost of the inquiry, as he had no information as to the expenses incurred by the complainants or the other interested parties who appeared by permission of the Referee.

Explosives Factory, Waltham Abbey

In reply to Mr. G. Locker-Lampson (House of Commons, February 28), Sir L. Worthington-Evans said it was difficult to say as yet whether it was proposed to close down the explosives factory at Waltham Abbey in accordance with the recommendation of the Geddes Committee.

Babcock and Wilcox Staff Concert

About 1,200 persons were present at the Queen's Hall, Langham Place, London, on February 24 on the occasion of the nineteenth annual smoking concert of the staff of Babcock & Wilcox, Ltd. Mr. C. S. Davy (manager of the London office) presided, and among those present were Sir John Dewrance, K.B.E. (chairman) and Sir James Kennal (managing director). Remarking that since the last concert in 1913 there had been many changes on the staff, the chairman said that all would regret that Mr. H. W. Kolle was no longer with them. He was away in South Africa, but they all hoped he would be back by the summer. During the evening the toast of "Babcock & Wilcox" was honoured, and Sir James Kennal responded. A long and varied musical programme was given by a number of capable artists, the arrangements having been carried out by a committee consisting of Messrs. A. H. Hamilton, A. A. Campbell, J. J. Outtrim, T. E. Eve, R. G. Pettle, S. D. Eyrl, W. A. Rains, W. V. Fleet, and F. L. Smith.

British West African Trade

Mr. W. Hulme Lever's Criticisms

Speaking on February 22 at the annual meeting of the Niger Co., Ltd., held at the Cannon Street Hotel, London, Mr. W. Hulme Lever, who presided, said he could not over-emphasise the handicap under which British West African trade was suffering owing to the policy of the Colonial Government. The cost of bringing a ton of palm kernels from a place 100 miles from Lagos to the United Kingdom amounted to £7 10s. 1d., or 83 per cent. of the cost of the kernels. The cost of exporting from a French West African colony was very much less. The freights on the British Government railways in Nigeria for oil and kernels average 6d. per ton mile, while in the Belgian Congo the charge averaged 1d. per ton mile. The heavy railway charges and export duties, apart from other incidental charges and ocean freights, amounted, for British West Africa in the case of palm oil, to no less than 89 per cent. of the price paid to the native. If the oil was shipped from British West Africa to France this figure became 114 per cent., as compared with 93 per cent. from the French Cameroons, 68 per cent. from the Ivory Coast, and 71 per cent. from Dahomey. Although he had himself seen a wonderful area of palm trees in the neighbourhood of Oshegbo, it was economically impossible to market the oil in Europe owing to the policy of the Government.

Dealing with the extended activities of the company, the chairman said they were now interested in the trade of West Africa from Dakar in the French Senegal in the north, to the River Congo in the south. They tapped a coast-line of over 3,000 miles and touched spots as far inland as 1,500 miles. The number of companies owned and controlled by the company was now thirty-one.

Company Formed to Produce Radio-Active Fertilisers

Particulars of the Radium Corporation of Czecho-Slovakia (Czechoslovak Corporation for the Utilisation of Radium, Ltd.) have been filed in this country. The Corporation is incorporated in Czecho-Slovakia, with chief office in Prague, being founded by the Czecho-Slovak State, as proprietor of radium and uranium colour mines, and the Imperial and Foreign Corporation, Ltd., London, for the duration of fifteen years. The principal object is the most profitable commercial exploitation of radium obtained from mines owned by the Czecho-Slovak State, as well as of all by-products resulting from the process of mining radium, and also for radio-active minerals and substances. This object is to be achieved, *inter alia*, by lending out radium for hire for temporary use; by producing and selling radio-active fertilisers, composed of various artificial fertilisers with admixtures of Joachimsthal residues which are no longer utilisable for the production of radium or other radio-active minerals; by the sale of radio-active minerals which are not utilisable for the production of radium; and by the sale of uranium colours. The original total capital is 10,000,000 Czech kronen, to which the Imperial and Foreign Corporation will contribute 5,000,000 kronen. The directors are: O. Mayer, G. Schmauss, J. Step, and J. Cros, all of Prague; L. K. Neumann (commercial secretary to the Czecho-Slovak Legation), Brig.-Gen. E. L. Spears, and Capt. S. Reilly, both of D3, The Albany, Piccadilly, London, W.; Sir Arthur du Cros, Messrs. Herbert Guedalla and John H. Guy. The British address is 441, Salisbury House, London, E.C. 2.

Affairs of a Perfumery Manufacturer

On February 15, Mr. Sydney Saville, Greencroft Gardens, Hampstead, London, N.W., attended before Mr. Registrar Mellor at the London Bankruptcy Court for public examination on accounts showing total liabilities of £16,458 (£11,358 unsecured) and no assets. In reply to the Official Receiver the debtor stated that in 1916 he, with capital provided by his father, commenced business as a wholesale perfumer under the style of the Rajeen Perfumery Company. He gave up the business in 1920, and in the December of that year went to Athens with a view to obtaining oil concessions, and generally embarking in trade with Greece. He attributed his failure and his insolvency to his personal expenditure having exceeded his income, to loss in connexion with the perfumery business and the failure of his Greek ventures. The examination was concluded.

From Week to Week

MR. STAFFORD ASTON, F.I.C., has been appointed county analyst for Middlesex.

The next meeting of the SOCIETY OF GLASS TECHNOLOGY will be held at Stourbridge on March 15.

MR. MAIDMAN, agent-general for the Niger Co., Ltd., will leave for British West Africa on March 8.

THE CHAIR OF MINING at Sheffield University, vacant by the death of Professor F. E. Armstrong, has been filled by the appointment of Mr. Douglas Hay, B.Sc., A.M.Inst.C.E.

It is reported from Washington that President Harding has suggested that some legislative action should be taken to permit the United States to get her quota of GERMAN REPARATION DYES.

At the meeting of THE ROYAL SOCIETY to be held on March 9, at 4.30 p.m., the Bakerian Lecture will be delivered by Professor T. R. Merton, F.R.S., and Mr. S. Barratt. The lecture is entitled "The Spectrum of Hydrogen."

MR. G. D. ADAMS, who has been with Fuerst Brothers, Ltd., and its predecessors in business for upwards of thirty-three years, has now joined the staff of A. Connell & Co., chemical merchants, 20, Bevis Marks, London, E.C.

THE ANNUAL DINNER of the Institute of Metals will be held at the Trocadero Restaurant, London, on March 8, at 8 p.m. Among the guests of the Institute will be Sir William Pope, Sir Ernest Rutherford, Sir Joseph Petavel, and Mr. A. Chaston Chapman.

The next meeting of the London Section of the Society of Chemical Industry will be held on Monday, March 6, in the rooms of the Chemical Society, Burlington House, Piccadilly, London, when Mr. W. Cullen will read a paper on "GOLD METALLURGY OF THE WITWATERSRAND, TRANSVAAL."

MR. GEORGE CROLL, of Millfield, Chislehurst, Kent, one of the pioneers of the plantation rubber industry, was run over and killed by a train at South Kensington Station on February 23. He was a director of Harrisons & Crosfield, Ltd., and of about twenty rubber companies associated with that business.

REAVELL & CO., LTD., of the Ranelagh Works, Ipswich, announce that they have moved their London office to larger and more commodious premises at 47, Victoria Street. Their telephone number ("5935 Victoria") remains as before. The head office of the business will continue to be at Ranelagh Works, Ipswich.

We regret to record the death, on February 22, at Valentine Mount, Freshwater Bay, Isle of Wight, of Dr. ALFRED HILL, M.D., F.R.S.E., F.I.C., late Medical Officer of Health for the City of Birmingham. Dr. Hill, who was in his ninety-sixth year, was a member of the Council of the Institute of Chemistry from 1882 to 1885.

At the second general meeting of the WEST YORKSHIRE METALLURGICAL SOCIETY, to be held in Bradford to-day (Saturday) Mr. J. E. Fletcher, Director of Research, British Cast Iron Research Association, will read a paper on "Surface and Internal Defects in Iron Castings, their Relationship, Cause, and Prevention."

The Board of Trade give notice that the hearing of the complaint that R. LACTOSE has been improperly included in the lists of articles chargeable with duty under Part I. of the Safeguarding of Industries Act, will take place to-day (Saturday) at the offices of the Board in Great George Street, London, S.W. 1, at 10 a.m.

Despite last year's reductions of 60 per cent. in the selling price of their oil and of 40 per cent. in the price of fertilisers manufactured at their Stratford factory, MR. E. BARNES, speaking at the annual meeting of Harrison, Barber, & Co., Ltd., on February 23, expressed himself in optimistic terms in regard to an improvement in trade during the current year.

Mr. J. G. Haller, Mildmay Chambers, 69, Bishopsgate, London, announces that he has formed his business into a private limited company. Mr. G. W. Phillips, who has been associated with him in business for many years past, will be managing director, and the style of the company will be HALLER & PHILLIPS, LTD. As chairman of the company Mr. Haller will continue to be actively associated with the business.

The new offices of the BRITISH OIL & FUEL CONSERVATION, LTD., attached to their works and laboratories at Willesden, are now completed and the registered offices are being transferred thither at the end of this month. Communications in future should be adddressed to 5, Hythe Road, Willesden, London, N.W. 10. The telephone number will be "Willesden 2442," and the telegraphic address "Oilfuworko, Kensal, London."

At a meeting of the Senate of LONDON UNIVERSITY on February 22, Dr. A. W. Porter, F.R.S., was appointed a member of the Council of the British Photographic Research Association. Dr. W. B. Tuck, University Professor of Chemistry at the Middlesex Hospital Medical School, and Mr. E. P. Metcalfe, Professor of Physics in the University of Mysore and Principal of the Central College, Bangalore, were appointed Fellows of University College.

The following papers were read on Friday at a meeting of the Manchester Section of the Society of Chemical Industry: "The Inorganic Constituents of Coal, Part II," by F. S. Sinnatt and N. Simpkin; "A Note on a Cause of Splitting of a Pottery Material," by Mrs. M. B. Craven; "The Effect of Water and of Certain Organic Salts upon Celluloses," by J. Huebner and F. Kaye; "The Action of Iodine upon Celluloses, Silk and Wool," by J. Huebner and J. N. Sinha.

We regret to record the death, on February 19, at The Oaklands, Penn Road, Wolverhampton, of Mr. Edward William Taylor Jones, F.I.C. Mr. Jones, who was seventy-five years old, was a pupil of the late Dr. Hofman. He held the offices of public analyst for the county of Stafford and the borough of Wolverhampton for a period of forty-nine years, and had been engaged in a similar capacity for Walsall, Stoke-on-Trent, Kidderminster, and Newcastle-under-Lyme. He leaves a widow, two sons, and one daughter.

The following papers, communicated by Professor W. M. Hicks, Professor A. Fowler, Sir William Pope, and Professor Filon were to be read at a meeting of THE ROYAL SOCIETY on Thursday:—"The Structure of the Band Spectrum of Helium," by W. E. Curtis; "The Spectrum of Beryllium Fluoride," by S. Datta; "The Catalytic Activity of Copper: Part III.," by W. G. Palmer; "The Motion of Ellipsoidal Particles immersed in a Viscous Fluid," and "The Rotation of two Circular Cylinders in a Viscous Fluid," by G. B. Jeffery.

Before the members of the Huddersfield Textile Society, on Friday, February 24, Dr. L. L. Lloyd, head of the dyeing department of the Bradford Technical College, lectured on "The Development and Prevention of Faults in Dyeing Piece Goods." He said he would object to the use of any kind of conditioning agent unless it had first been examined carefully by a chemist to see there was no chance of it affecting other properties, and he objected entirely to the use of soluble oils for conditioning. Another fault was due to the use of unsuitable oils in spinning.

Papers on "The Molecular Configurations of Polynuclear Aromatic Compounds. Part I. The resolution of γ-6 : 6-dinitro-and 4 : 6 4 : 6-tetranitrodiphenic acids into optically active components," by G. H. Christie and J Kenner; "New Halogen Derivatives of Camphor. Part II. α-bromocamphor," by T. M. Lowry, V. Steele and H. Burgess; and "The Rotatory Dispersive Power of Organic Compounds. Part X. The preparation and properties of pure ethyl tartrate," by T. M. Lowry and J. O. Cutter, were read on Thursday at a meeting of THE CHEMICAL SOCIETY.

Lecturing to the Huddersfield Technical College Chemical Society on Friday, February 24, Mr. H. H. Gray outlined the faults and prime necessities in the training of technical chemists. The present educational system, he said, was in grave danger, and whilst the desire to economise on education was praiseworthy to an extent, there was vital risk of error in the items to which the economy should be applied. It was the business of the technical chemist to observe economy in carrying out his processes and to this end the student's general intelligence, and particularly his "chemical sense," must be developed.

About 120 members and guests of the NEWCASTLE CHEMICAL INDUSTRY CLUB attended the annual dance on Wednesday night in the King's Hall, Armstrong College, Newcastle, when Mr. and Mrs. Trobridge acted as host and hostess. The dance was a great success. Miss Wallis, on behalf of the Committee, presented Mrs. Trobridge with a bouquet. Amongst those present were Mr. and Mrs. Hirsch; Dr. J. H. and Mrs. Paterson; Professor and Mrs. Briscoe, Mr. J. A. Harle, Dr. G. Weyman, Eng. Commander and Mrs. E. V. Hawkes, Professor Haworth, and many other prominent members of chemical industry in the district.

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SOAP. Solutions and sols; detergent action of soap. Part II. C. Gillet. *Rev. gén. des Matières Colorantes*, January, 1922, pp. 1-6.

German

LIQUID AIR. Plant for air liquefaction and the production of oxygen and nitrogen. E. Blau. *Chem.-Zeit.*, January 26, 1922, pp. 85-88.

ANALYSIS. Estimation of magnesium in technical nickel. K. Chalupny and K. Breisch. *Chem.-Zeit.*, January 26, 1922, p. 91.

The volumetric and gravimetric estimation of zinc. S. Urbasch. *Chem.-Zeit.*; Part IV., January 28, 1922, pp. 97-99; Part V., January 31, 1922, pp. 101-103; Part VI., February 7, 1922, pp. 125-127; Part VII., February 10, 1922, pp. 133-134.

GELATINE. The manufacture of gelatine and glue from animal matter. R. Kissling. *Chem.-Zeit.*, February 2, 1922, pp. 113-116.

TAR. The removal of phenols by washing with sodium sulphide solution. F. Fischer, H. Tropsch and P. K. Breuer. *Brennstoff-Chem.*, January 1, 1922, pp. 1-3.

FUEL. The systematic investigation of solid fuels with particular reference to the direct determination of the volatile constituents. W. Fritsche. *Brennstoff-Chem.*, Part IV., January 1, 1922, pp. 4-10; Part V., January 15, 1922, pp. 18-25.

The formation of nethane in the water gas process. H. Tropsch and A. Schellenberg. *Brennstoff-Chem.*, February 1, 1922, pp. 33-37.

DEXTRINS. The production of dextrins by the inversion of sugar. G. Bruhns. *Z. angew. Chem.*, Part II., February 7, 1922, pp. 61-67; Part III., February 10, 1922, pp. 70-71; Part IV., February 14, 1922, pp. 77-80.

Miscellaneous

ACIDS. The mixed anhydrides of sulphuric acid and carboxylic acids. Part II. Normal butyrylsulphuric acid. A. J. van Peski. *Rec. Trav. Chim. des Pays-Bas.*, December 15, 1921, pp. 736-746.

Preparation of acrylic acid and some of its derivatives. J. H. N. van der Burg. *Rec. Trav. Chim. des Pays-Bas*, January 15, 1922, pp. 21-23.

ANALYSIS. The estimation of the volatile matter in coal. Part II. G. Delmarcel and E. Mertens. *Bull. Fed. Ind. Chim. Belg.*, November, 1921, pp. 75-83.

FLUORINE COMPOUNDS. Some aliphatic fluorides. F. Swarts. *Bull. Soc. Chim. Belg.*, November, 1921, pp. 302-315.

Patent Literature

Abstracts of Complete Specifications

174,306. Red Oxide of Iron, Manufacture of. D. Tyrer, Stoneleigh, West Villas, Stockton-on-Tees. Application date, June 8, 1921.

The process is for producing red oxide of iron pigment from ferrous chloride solution, such as galvanisers' waste pickle. The liquor is first neutralised by means of metallic iron or natural ferrous carbonate, and then mixed with ground natural barium carbonate (witherite) and the mixture evaporated to dryness. The amount of barium carbonate should be 50-100 per cent. above that theoretically necessary to convert the chloride into oxide, and it should be ground so that all passes through a 30-mesh sieve but none through a 150-mesh sieve. The dried mixture is roasted in air to about 300°C. and assumes a red colour. The mixture is then digested with water to remove the barium chloride, and the very fine iron oxide remains in suspension. The barium carbonate quickly settles and may be removed. The barium chloride may be evaporated and crystallised, and the barium carbonate recovered may be used again. The yield of iron oxide may be increased by adding a very finely-divided iron compound, such as hydrated ferric oxide, ferrous carbonate, or iron pyrites, which are decomposable under the conditions indicated.

174,389. Hydrocarbons, Process for Treating. A. J. Stephens, London. (From The Canadian-American Finance and Trading Co., Ltd., 511, Union Bank Building, Victoria, B.C., Canada.) Application date, August 12, 1920.

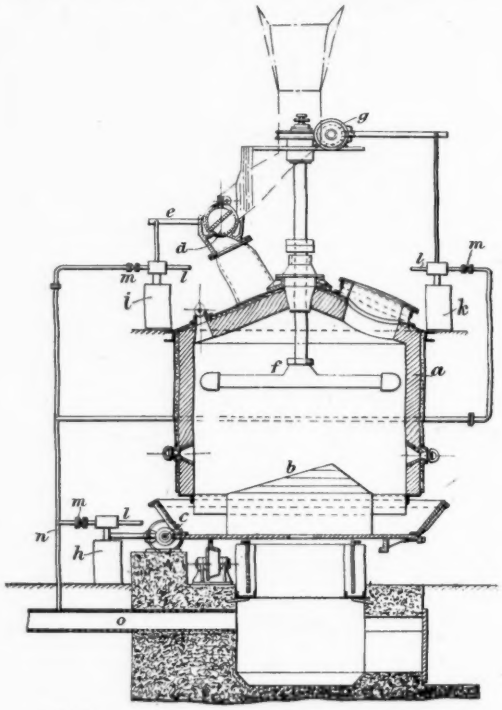
The process is for distilling hydrocarbons and condensing the volatile products at a pressure above the distillation pressure, so that unsaturated compounds due to dissociation are converted into saturated compounds and the free hydrogen is recombined. The process is applicable for treating hydrocarbon vapour produced in gas retorts, coke ovens, and shale retorts, also vapour produced from crude or unrefined and refined oils obtained by vacuum distillation, distillation at or above atmospheric pressure, steam distillation, indifferent gas distillation, or pyrogenetic decomposition. The steam or gas distillation referred to is that in which the steam or gas is supplied at high temperature to furnish the necessary heat, but not to act as a carrier. In the hydrogenation of hydrocarbons the result depends upon the concentration of hydrogen in the vapour mixture, the pressure of the mixture, the temperature of condensation, and the period during which hydrogenation takes place. It is found that in the neighbourhood of the dew-point of the vapour, a small reduction in temperature may be compensated by a considerable increase in the pressure or in the time of the reaction. The condensation is effected at or immediately below the dew-point of the hydrocarbon or a constituent which is to be recovered. A number of hydrocarbon constituents of a mixture may be recovered independently by using more than one pump, condenser and receiver, the pressure in each condenser being that necessary to condense the required fractional product.

174,418. Oxygen Gas, Generation of. L. A. Levy, 31, Shoot-up Hill, Cricklewood, and R. H. Davis, 187, Westminster Bridge Road, London. Application date, October 20, 1920.

The process is for preparing oxygen by a simple method in circumstances in which the usual commercial methods are not applicable. A mixture of sodium perborate, preferably the monohydrate, and about 1 per cent. of potassium permanganate of manganese dioxide evolves oxygen on contact with water. The rapidity of the reaction is less rapid but more regular than if sodium peroxide is used. Reference is directed in pursuance of sect. 7, sub-sect. 4 of the Patents and Designs Acts, 1907 and 1919, to Specifications Nos. 4,500/1904, 23,165/1906, 7,062/1910, 1,066/1910, 24,641/1910, and 18,987/1911.

174,498. Gas Producers and the Like. N. E. Rambush, Parkfield Works, Stockton-on-Tees. Application date, November 26, 1920.

A gas producer usually includes a revolving grate, a mechanical feed, and mechanical stirrer, which are operated from a common counter-shaft driven by a motor, and these parts in each of a battery of producers may also have a common drive. In such apparatus it is difficult to adjust the speed of one part to suit varying conditions without interfering with the speed of other parts. In this invention, a separate reciprocating steam engine is used for operating each part, and the exhaust



174,498.

steam from each engine is delivered into the air blast of the producer. The producer *a* is provided with a rotary grate *b* driven by a reciprocating steam engine *h* through gearing *c*. A mechanical feed *d* is driven by a steam engine *i* through gearing *e*, and a mechanical stirrer *f* is driven by a steam engine *k* through gearing *g*. All these engines are supplied with steam from a common source through pipes *l*, and the exhaust passes through pipes *m*, *n* to the blast *o* and thence to the producer.

174,554. Hydroquinone, Process for the Manufacture of. W. Carpmael, London. (From Chemische Fabrik auf Actien vorm. E. Schering, Mullerstrasse 170-171, Berlin, N. 39) Application date, September 19, 1921.

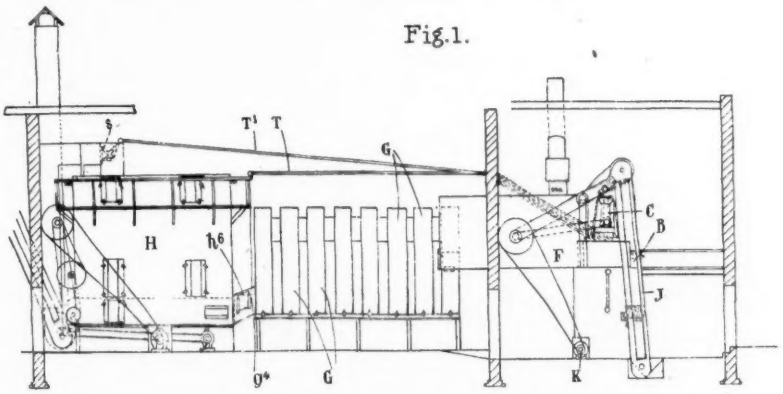
Hydroquinone is obtained by heating a mixture of quinhydrone and an aqueous mixture of a ferrous salt and an alkaline earth carbonate, or alternatively metallic iron and water. In an example, quinhydrone is gradually added to a boiling mixture of ferrous sulphate solution and precipitated barium carbonate, and the mixture heated as long as carbon dioxide is evolved. The mixture is filtered while hot and the filtrate dried in vacuo. In the reduction of quinone to hydroquinone, about one half of the quinone is reduced in the usual manner and the reduction completed by the present process.

174,555. Furnaces for the Production of Mineral Distillates of Definite Composition. H. Mayers, 17, Redriffe Road, Plaistow, London, and Britons, Ltd., The Stowage, Deptford, London. Application date, October 7, 1918.

The furnace is for the production of mineral distillates such as zinc white or lead sulphate for use as pigments. In the processes usually employed it is difficult to obtain products of constant composition, colour and texture, owing to the very delicate adjustment which is necessary in flame reactions. In such furnaces the resistance to the blast varies continuously owing to the accumulation of ash, slag, or gangue, intermittent

cleaning, additions of coke, and variation in resistance of the filters for removing the fume. In the present invention, the furnace is divided into three superposed zones, the upper and lower being cooled by water-jackets to prevent destruction of the furnace lining by the mineral vapours or the slag. Means are provided for making use of wet ores, which is particularly advantageous in the case of zinc ores, since the production of dust and contamination of the products is avoided. The furnace A is divided into three zones A^1, A^2, A^3, the upper and lower having water conduits a, a^2. The mineral is raised by a conveyor J, and supplied to a conical hopper C, from which it is delivered through a central opening at the bottom by a rotary conveyor c^2 mounted on a vertical shaft c^3. The material is spread over the surface of the coke charge E by means of a distributing blade d rotating at a different speed from that of the conveyor c^2. The conveyors J, c^2, and distributor d, are all driven by gearing from a single motor K. Water passes in series through the upper and lower channels a, a^1, and then through the hollow furnace bars a^2. The upper channel is further removed from the furnace than the lower, as the cooling effect required is less and the temperature must not be reduced sufficiently to condense the metallic vapour. Openings a^9, a^{10} are provided for the admission of air to oxidise the vapour, and the furnace roof may be constructed in the form of louvres to admit air. Air for the combustion of the fuel is admitted through the adjustable inlet a^{13}. The

Fig.1.



174,555.

vapour is observed through the air inlets by means of a spectroscope. When no spectrum lines are visible the vapour is fully oxidised and the air is adjusted accordingly. The gas and vapour pass into a preliminary cooling chamber F, and thence into a series of cooling chambers G in which the fume is deposited, assisted if necessary by electrostatic action. The gases then pass through a passage g^4 to a filter H. The filter is divided by partitions into a number of compartments, each containing a large number of filter bags open at their lower ends and carried by shaking-rods, so that the deposit may be detached. The outlet from the filter chamber H is controlled by a door s which, together with the door h^6, may be controlled by flexible connections T, T^1, from the front of the furnace in accordance with the observed conditions.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 153,254 (L'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude), relating to catalytic materials for use in the synthesis of ammonia, *see* Vol. IV., p. 105; 157, 849 (Chemische Fabriken Worms Akt.-Ges.), relating to a process of distillation, *see* Vol. IV., p. 456.

International Specifications not yet Accepted

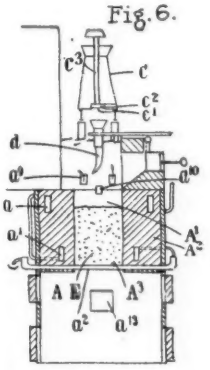
173,225. ARTIFICIAL RESINS. Barrett Co., 40, Rector Street, New York (assignees of C. R. Downs and L. Weisberg). International Convention date, December 22, 1920.

A polyhydric alcohol such as glycerol, glycol, diglycerol, or triglycerol is heated with a dibasic, tribasic or polybasic aliphatic acid, or a dibasic aromatic acid which is anhydride forming, or a polynuclear aromatic acid. Suitable aliphatic acids are fumaric, maleic, malic, succinic or tartaric; citric or malomalic. Suitable aromatic acids are phthalic, diphenic, 1 : 8-naphthalic, benzoylbenzoic, methylbenzoyl-benzoic or chlorbenzoyl-benzoic. Three types of resins may be obtained according to the heating temperature, (1) a fusible solid soluble in acetone and decomposed by cold water. (2) An infusible solid, insoluble in acetone, but decomposed by boiling water. (3) A resin insoluble in organic solvents, not affected by cold or hot water, or cold acids, but converted by caustic soda into the alcohol and the sodium salt of the acid used in its production. The products are suitable, with or without the addition of fillers, for the manufacture of moulded articles, or the solution in acetone may be used as a varnish.

173,479. PURIFYING LACTIC ACID. J. Schatzkes, 10, Passauerstrasse, Berlin. International Convention date, December 27, 1920.

The lactic acid fermentation is effected in the presence of magnesium carbonate, hydroxide, or oxide, so that magnesium lactate is produced. This is treated with sulphuric acid to liberate lactic acid, which is extracted with acetone or ether. Alternatively, magnesium lactate may be produced by double decomposition of a soluble lactate such as calcium lactate with a magnesium salt such as the sulphate. The lactic acid may alternatively be obtained by suspending magnesium lactate in acetone or ether and agitating with sulphuric acid. Magnesium sulphate separates, and the lactic acid solution is evaporated. The process may be applied to the purification of commercial lactic acid. The final product may be purified with bone-black.

Fig.6.



173,502. MAGNESIA FROM DOLOMITE. C. Clerc, 29, Rue d'Astorg, Paris, and A. Nihoul, 29, Passages des Favorites, Paris. International Convention date, December 24, 1920.

Dolomite is calcined at 1,000°—1,200°C., and the product treated with sufficient water to hydrate part of the lime but not the magnesia. The fine powder thus obtained is separated from coarser particles of siliceous material, and then gradually added to an excess of magnesium chloride solution. Magnesia is precipitated in a granular form, and the lime goes into solution. To obtain the magnesium chloride required for this process, the calcium chloride obtained by filtering off the precipitated magnesia is diluted to 6°Bé., and mixed with the calcined and partly hydrated dolomite. Carbon dioxide is passed through the mixture, to precipitate calcium carbonate, and the magnesium chloride is filtered off. As an alternative, magnesium chloride may be obtained in a similar manner from the waste liquor obtained in the recovery of ammonia in the Solvay ammonia-soda process. In another alternative, the ammoniacal liquor from the Solvay process is freed from sulphates and carbonates by adding calcium or barium chloride and then heated with the mixture of magnesia and lime, or with pure magnesia, to expel ammonia. The resulting solution of calcium and magnesium chlorides is filtered and then treated as above to obtain magnesia.

173,504. PULVERULENT FUEL. E. Bouchaud-Praceiq, 39, Avenue d'Eylau, Paris. International Convention date, December 24, 1920.

Finely divided peat is mixed with coal or lignite. Peat usually has a calcareous ash and coal or lignite has a silico-

aluminous ash, and the proportions are so adjusted that the ash may subsequently be utilised for making hydraulic cements. Iron oxide must also be present.

173,507. SELENIDES AND TELLURIDES. L. Lilienfeld, 1, Zeltgasse, Vienna. International Convention date, December 23, 1920.

Colloidal metallic selenides or tellurides are obtained by the action of selenium or tellurium compounds on a metallic solution in the presence of a protective colloid such as gelatin, proteids, gum arabic, starch, dextrin, or the water-soluble derivates of polysaccharides. In an example, a 1% solution of gold chloride is mixed with methyl or ethyl cellulose and the mixture treated with hydrogen selenide. The hydrosol of gold selenide is heated to 50°—80°C. to coagulate the alkyl cellulose which carries the gold selenide with it. The precipitate is washed with hot water, and may be dried or dissolved in cold water. Other metallic selenides or tellurides may be obtained in a similar manner. The compounds are used for medicinal purposes.

LATEST NOTIFICATIONS

175,589. Compressed vanillin. Société Chimique des Usines du Rhone. February 17, 1921.

175,605. Manufacture of hydrogen by partial liquefaction of mixtures of gases containing the same. L'Air Liquide, Société Anonyme des Procédés. G. Claude. February 17, 1907.

175,622-3. Processes for drying yeast. Klein, E. February 15, 1921.

Specifications Accepted, with Date of Application

154,162. Tanning materials, Manufacture of. Chemische Fabriken Worms Akt.-Ges. August 20, 1917.

154,907. Dioxydiethyl sulphide, Manufacture of esters of. Farbwerke vorm. Meister, Lucius, and Brüning. January 20, 1919.

155,781. Calcium iodide, Process for the manufacture of preparations of—fit for therapeutic purposes. W. Spitz. March 10, 1916.

157,226. Aurothiosalicylic acid, Manufacture of complex. Farbwerke vorm. Meister, Lucius, and Brüning. October 13, 1915.

158, 863. Sodium bicarbonate and hydrogen, Method of producing. Nitrogen Corporation. February 7, 1920.

159,497. Carbonaceous materials, Treatment of. W. E. Trent. February 25, 1920. Addition to 151,236.

159,837. Chlorotoluenes. Soc. Anon. des Matieres Colorantes et Produits Chimiques de Saint-Denis, and A. R. Wahl. March 6, 1920.

163,277. Hydrocarbon oils, Processes and apparatus for the conversion of. V. L. Emerson. May 6, 1920.

163,679. Resinous substances and tanning materials, Process for the manufacture of. M. Melamid. May 17, 1920.

174,960-1. Artificial silk, Manufacture of. E. Bronnert. August 3 and 6, 1920.

174,965. Volatilising and decomposing hydrocarbons, Process for. A. J. Stephens. (*Canadian American Finance and Trading Co., Ltd.*) August 9, 1920.

174,974. Immersing subdivided solids or liquids in liquids, Method of—particularly applicable for immersing solids or liquids in molten metal. Thermal Industrial and Chemical (T.I.C.) Co., Ltd., and J. S. Morgan. September 7, 1920.

174,995. Electrical precipitation of suspended particles from gaseous media, Process of and apparatus for. A. L. Mond. (*International Precipitation Co., Inc.*) October 15, 1920.

175,006. Aluminium chloride, Process for producing. E. R. Wolcott. November 1, 1920.

175,019. Ortho-sulphonic acids of aromatic amines, Manufacture of. British Dyestuffs Corporation, Ltd., J. Baddiley, J. B. Payman and H. Wignall. November 3, 1920.

175,021. Hydrogenation of oils and liquid fats. W. J. Mellersh-Jackson. (*American Cotton Oil Co.*) November 3, 1920.

175,050. Clay, Treatment of. W. Feldenheimer and W. W. Plowman. November 8, 1920.

175,077. Dialkyl sulphates, Manufacture of. British Cellulose & Chemical Manufacturing Co., Ltd., and W. Bader. November 12, 1920.

175,116. Petroleum and natural gas, Recovery of. A. Ehrat. November 26, 1920.

175,201. Borax and boric acid, Process for the manufacture of. A. Kelly and R. B. R. Walker. March 3, 1921.

Applications for Patents

Andreu, P., and Paquet, R. Fixation of nitrogen. 5336. February 23. (France, February 23, 1921.)

Benson, M. Flotation processes, &c. 5108. February 21.

Beswick, W., and Rambush, N. E. Manufacture of producer gas with recovery of by-products. 5118. February 21.

Bichowsky, F. von. Processes for synthetic production of alkali metal cyanides. 5217. February 22.

Boehringer Sohn, C. H., and Stenzl, H. Process for preparation of papaverine nitrite. 5050. February 21.

British Dyestuffs Corporation, Ltd., Fairbrother, T. H., and Renshaw, A. Treatment of sewage. 5515. February 24.

Callard, V. S. Aerial ropeways, &c. 4977. February 20.

Chapman, D. L., Taylor, R., and Tizard, H. T. Method of chlorinating hydro-carbons and their derivatives. 5646. February 25.

Chemical Engineering Co. (Manchester), Ltd., and Spensley, J. W. Extraction of oils and fats from seeds, nuts, &c. 5338. February 23.

Farbenfabriken vorm. F. Bayer & Co. Process for manufacture of hyposulphites. 4981. February 20. (Germany, March 3, 1921.)

Green, R. Compositions of cellulose acetate and cellulose nitrate. 5414. February 23.

Harrison, W. Manufacture of azo dye-stuffs. 4880. February 20.

Hirchberg, L. M. Manufacture of formaldehyde. 5212. February 22.

Hirchberg, L. M. Production of aqueous solutions of formaldehyde. 5213. February 22.

Hirchberg, L. M. Production of formaldehyde by catalysis. 5214. February 22.

King, O. Organic compounds. 5314. February 23.

Moeller, J. Method of fractional distillation of hydrocarbons. 5041. February 21.

Paterson, A. Desulphurisation of oils, &c. 5391. February 23.

Rhenania Verein Chemischer Fabriken Akt.-Ges. and Rusberg, F. Process for rendering soluble crude phosphates. 4966. February 20. (Germany, March 23, 1921.)

Safe Superheat, Ltd. Retorts. 5559. February 24.

Schweizerische Sodafabrik. Treatment of bleaching earths. 5670. February 25. (Switzerland, March 2, 1921.)

Solica Gel Corporation. Process of recovering solutes from solution. 5232. February 22. (United States, February 25, 1921.)

Patents Court Cases

APPLICATION has been made for the following patents to be indorsed "Licences of Right" under Sec. 24 of the Patents and Designs Acts, 1907 and 1919:—106,080 (Bostaph Engineering Co.) relating to a process of transforming hydrocarbons into other hydrocarbons relatively poorer in hydrogen; 147,867 (A. M. Fairlie) relating to filling material for reaction spaces.

Application has also been made, under Sec. 20, by L. Cassella & Co., G.m.b.H., for the restoration of lapsed patent 2,918/1909 (L. Haas) relating to derivatives of carbazol and dyestuffs formed therefrom. Any notice of opposition must be given by April 24, 1922.

German Soap Industry in 1921

THE soap industry in Germany, according to a writer in the *Zeitschrift der Deutschen Öl und Fett-Industrie*, has suffered the same vicissitudes of fortune inevitable during and after the war as all other trades. The chief disturbing factor has been, of course, the fluctuation of the mark. Periods of abnormal demand, coupled with lack of raw materials and labour, have alternated with those of excessive production and failure to dispose of the goods manufactured. It is reported that various difficulties have arisen between the different syndicates handling raw materials, and the failure of the soap syndicate may, in some measure, be attributed to these. Various discussions have taken place as to the advisability of protecting the industry by legislation, but the general feeling being in favour of allowing it to recover by natural and steady means, no definite restrictions have been passed, beyond those of closing down all factories opened after August, 1914, and insisting upon a clear differentiation from manufacturers between "pure" and clay-"filled" soap.

The outlook for 1922 is regarded, on the whole, as favourable. The small manufacturer, after the first year of freedom from State control, is not as badly off as might be imagined, in spite of handicaps on the one hand from private enterprise and of attempted profiteering by some of the larger concerns on the other. Two points left over by the syndicate still remain to be settled. These are the amount of compensation due to the closed-down factories, and the administration of funds for an institute of research for the trade at Karlsruhe. It is too early yet to look for a convention to settle all these questions, but the present administration of the oils and fats trades by one department of the Ministry of Industry is regarded as a step in the right direction.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The weekly report contains only commodities whose values are at the time of particular interest or of a fluctuating nature. A more complete report and list are published once a month. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

LONDON, MARCH 2, 1922.

BUSINESS has expanded during the current week and the volume of trade now passing is greater than it has been for some time past.

Stocks are moving off, with a number of products becoming very light, and prices are "firming."

The export demand is also improving, although up to the present not a great amount of business has been concluded. Foreign buyers, however, are improving on their ideas of price.

General Chemicals

ACETONE is in fair request and the price is firm.

ACETIC ACID has again slightly advanced, and the material is scarce on the spot.

ACID FORMIC continues in demand, and the price is very firm.

ACID LACTIC is moderately active.

ACID OXALIC continues its recent advance, and spot stocks are very light.

ACID TARTARIC.—The downward movement seems to have been arrested, and there is a better demand.

BLEACHING POWDER is without change.

BORAX and BORIC ACID.—Prices have again been reduced by makers.

CALCIUM CARBIDE has been on offer at last quoted figures.

COPPER SULPHATE continues a slow market, but the inquiry has slightly improved.

FORMALDEHYDE is in fairly good request, and the market is in firm hands.

LEAD ACETATE has been in small request, but the price is firm.

LEAD NITRATE is without change.

LITHOPONE is only in small demand at last quoted figures.

POTASSIUM BICARBONATE has been a better market, and there are a few inquiries about.

POTASSIUM CAUSTIC is still in buyers' favour, although the price is slightly firmer than last reported.

POTASSIUM PRUSSIATE has advanced in value, and stocks are very light.

SODIUM ACETATE has been a moderately good market with price unchanged.

SODIUM BICHROMATE is weak, and there has been pressure to sell.

SODIUM CHLORATE is only a moderate market.

SODIUM NITRITE continues flat with little inquiry.

SODIUM PRUSSIATE.—The recent weakness in this article is disappearing, and this product is again extremely firm.

ZINC OXIDE is on offer at last quoted figures.

Coal Tar Intermediates

A MODERATE amount of business has been transacted during the current week at recent figures. There is a fair amount of export inquiry, but little business has so far resulted.

ALPHA NAPHTHOL has been in fair request, and the price is firm.

ALPHA NAPHTHYLAMINE is quietly steady with a moderate amount of business to report.

ANILINE OIL AND SALT are fairly satisfactory, and there is no change in value.

BETA NAPHTHOL has been more in request, and the price is now approaching that asked by the makers.

BETA NAPHTHYLAMINE is quiet and the price is steady.

DINITROCHLORBENZOL has been in fair request.

DIMETHYLANILINE passes steadily into consumption at recent figures.

DIPHENYLAMINE is without change, and the stocks are very light.

"G" SALT is without feature.

"H" ACID is firm, and stocks are very light.

METANITRANILINE has been asked for, and is without change in value.

PARANITRANILINE remains quietly steady.

PARAPHENYLENEDIAMINE is steady without change in value.

"R" SALT has been somewhat quiet.

Coal Tar Products

THERE is little fresh business doing in coal tar products, and the market generally has an easier tendency.

90's BENZOL is quiet and can be bought at 2s. 4d. on rails.

PURE BENZOL is also uninteresting, and is worth about 2s. 8d. on rails in the Midlands, and about 3s. in the South.

CRESYLIC ACID is also plentiful, and the demand is very poor. The Pale quality is quoted 2s. per gallon on rails, and the Dark quality 95/97 per cent. is quoted at 1s. 9d.

SOLVENT NAPHTHA is steady, and is quoted at 2s. 3d.

HEAVY NAPHTHA is in poor demand, and is not worth more than 2s. on rails.

NAPHTHALENE is weak, Crude qualities being worth from £5 to £7 per ton, and Refined from £15 to £17 per ton.

CREOSOTE OIL is plentiful, and is worth about 4d. to 4¼d. per gallon.

Current Prices

Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	1	10	to	0	2	0
Acetone oil	ton	87	10	0	to	90	0	0
Acetone, pure	ton	80	0	0	to	82	10	0
Acid, Acetic, glacial, 99-100%	ton	55	0	0	to	60	0	0
Acetic, 80% pure	ton	47	0	0	to	48	0	0
Arsenic	ton	90	0	0	to	95	0	0
Boric, cryst	ton	60	0	0	to	70	0	0
Carbolic, cryst. 39-40%	lb.	0	0	6½	to	0	0	7
Citric	lb.	0	1	11	to	0	2	0
Formic, 80%	ton	72	10	0	to	75	0	0
Gallic, pure	lb.	0	3	6	to	0	3	9
Hydrofluoric	lb.	0	0	8½	to	0	0	9
Lactic, 50 vol	ton	40	0	0	to	43	0	0
Lactic, 60 vol	ton	43	0	0	to	45	0	0
Nitric, 80 Tw	ton	30	0	0	to	31	0	0
Oxalic	lb.	0	0	8½	to	0	0	9
Phosphoric, 1.5	ton	43	0	0	to	45	0	0
Pyrogallic, cryst	lb.	0	6	9	to	0	7	0
Salicylic, Technical	lb.	0	0	10½	to	0	1	0
Salicylic, B.P	lb.	0	1	4	to	0	1	6
Sulphuric, 92-93%	ton	8	0	0	to	8	10	0
Acid Tannic, commercial	lb.	0	2	9	to	0	3	0
Tartaric	lb	0	1	3	to	0	1	4
Alum, lump	ton	12	10	0	to	13	0	0
Alum, chrome	ton	30	10	0	to	32	0	0
Alumino ferric	ton	9	0	0	to	9	10	0
Aluminium, sulphate, 14-15%	ton	12	0	0	to	13	0	0
Aluminium, sulphate, 17-18%	ton	13	10	0	to	14	10	0
Ammonia, anhydrous	lb.	0	1	8	to	0	1	10
Ammonia, .880	ton	35	0	0	to	37	0	0
Ammonia, .920	ton	22	0	0	to	24	0	0
Ammonia, carbonate	lb.	0	0	4	to		—	
Ammonia, chloride	ton	60	0	0	to	65	0	0
Ammonia, muriate (galvanisers)	ton	35	0	0	to	37	10	0
Ammonia, nitrate	ton	55	0	0	to	60	0	0
Ammonia, phosphate	ton	90	0	0	to	95	0	0
Ammonia, sulphocyanide	lb.	0	3	0	to		—	
Amyl acetate	ton	150	0	0	to	160	0	0
Arsenic, white, powdered	ton	42	0	0	to	44	0	0
Barium, carbonate, 92-94%	ton	12	10	0	to	13	0	0
Barium, Chlorate	lb.	0	0	11	to	0	1	0
Chloride	ton	14	10	0	to	15	10	0
Nitrate	ton	40	0	0	to	42	0	0
Sulphate, blanc fixe, dry	ton	24	0	0	to	25	0	0
Sulphate, blanc fixe, pulp	ton	15	0	0	to	16	0	0
Sulphocyanide, 95%	lb.	0	1	6	to		—	
Bleaching powder, 35-37%	ton	14	0	0	to		—	
Borax crystals	ton	29	0	0	to	33	0	0
Calcium acetate, Brown	ton	8	0	0	to	9	0	0
" Grey	ton	10	0	0	to	11	0	0
Calcium Carbide	ton	16	0	0	to	17	0	0
Chloride	ton	7	10	0	to	8	0	0

	Per	£	s.	d.		£	s.	d.
Carbon bisulphide	ton	60	0	0	to	62	0	0
Casein, technical	ton	75	0	0	to	80	0	0
Cerium oxalate	lb.	0	3	6	to	0	3	9
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	11	0	to	0	11	6
Oxide, black	lb.	0	10	6	to	0	11	0
Copper chloride	lb.	0	1	3	to	0	1	0
Sulphate	ton	28	10	0	to	29	0	0
Cream Tartar, 98-100%	ton	120	0	0	to	125	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol	ton	82	0	0	to	83	0	0
Formusol (Rongalite)	lb.	0	3	9	to	0	4	0
Glauber salts, commercial	ton	4	5	0	to	4	10	0
Glycerine, crude	ton	70	0	0	to	72	10	0
Hydrogen peroxide, 12 vols	gal.	0	2	5	to	0	2	6
Iron perchloride	ton	30	0	0	to	32	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	45	0	0	to	47	0	0
Carbonate (White Lead)	ton	40	0	0	to	44	0	0
Nitrate	ton	48	10	0	to	50	10	0
Litharge	ton	35	10	0	to	36	0	0
Lithopone, 30%	ton	26	0	0	to	27	0	0
Magnesium chloride	ton	10	10	0	to	11	0	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	8	10	0	to	9	10	0
Sulphate (Druggists')	ton	13	10	0	to	14	10	0
Manganese, Borate	ton	70	0	0	to	75	0	0
Sulphate	ton	70	0	0	to	75	0	0
Methyl acetone	ton	85	0	0	to	90	0	0
Alcohol, 1% acetone	ton	75	0	0	to	77	10	0
Nickel sulphate, single salt	ton	61	0	0	to	62	0	0
Ammonium sulphate, double salt	ton	62	0	0	to	64	0	0
Potash, Caustic	ton	34	0	0	to	35	0	0
Potassium bichromate	lb.	0	0	7¼	to		—	
Carbonate, 90%	ton	31	0	0	to	33	0	0
Chloride 80%	ton	15	0	0	to	20	0	0
Chlorate	lb.	0	0	4½	to	0	0	5
Meta bisulphite, 50-52%	ton	84	0	0	to	90	0	0
Nitrate, refined	ton	45	0	0	to	47	0	0
Permanganate	lb.	0	0	9	to	0	0	10
Prussiate, red	lb.	0	3	0	to	0	3	3
Prussiate, yellow	lb.	0	1	2	to	0	1	2½
Sulphate, 90%	ton	20	0	0	to	22	0	0
Salammoniac, firsts	cwt.	3	5	0	to		—	
Seconds	cwt.	3	0	0	to		—	
Sodium acetate	ton	25	0	0	to	26	0	0
Arsenate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	5½	to		—	
Bisulphite, 60-62%	ton	25	0	0	to	27	10	0
Chlorate	lb.	0	0	3¾	to	0	0	4
Caustic, 70%	ton	24	0	0	to	24	10	0
Caustic, 76%	ton	25	10	0	to	26	0	0
Hydrosulphite, powder, 85%	lb.	0	2	3	to	0	2	6
Hyposulphite, commercial	ton	13	10	0	to	14	0	0
Nitrite, 96-98%	ton	37	10	0	to	40	0	0
Phosphate, crystal	ton	20	10	0	to	21	0	0
Perborate	lb.	0	1	2	to	0	1	3
Prussiate	lb.	0	0	9½	to	0	0	10
Sulphide, crystals	ton	13	0	0	to	14	0	0
Sulphide, solid, 60-62%	ton	24	10	0	to	25	0	0
Sulphite, cryst	ton	13	0	0	to	14	0	0
Strontium carbonate	ton	60	0	0	to	65	0	0
Strontium Nitrate	ton	60	0	0	to	62	10	0
Strontium Sulphate, white	ton	7	10	0	to	8	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Sulphur, Flowers	ton	13	0	0	to	14	0	0
Roll	ton	13	0	0	to	14	0	0
Tartar emetic	lb.	0	1	6½	to	0	1	7
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	5	to	0	1	6
Zinc chloride, 102 Tw	ton	21	0	0	to	22	10	0
Chloride, solid, 96-98%	ton	35	0	0	to	40	0	0
Oxide, 99%	ton	38	0	0	to	40	0	0
Dust, 90%	ton	47	10	0	to	50	0	0
Sulphate	ton	18	10	0	to	19	10	0

Coal Tar Intermediates, &c.

	Per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	2	3	to	0	2	6
Alphanaphthol, refined	lb.	0	2	9	to	0	3	0
Alphanaphthylamine	lb.	0	2	0	to	0	2	3
Aniline oil, drums extra	lb.	0	1	0	to	0	1	1
Aniline salts	lb.	0	1	1	to	0	1	2
Anthracene, 40-50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	3	9	to	0	4	3
Benzidine, base	lb.	0	5	9	to	0	6	0
Benzidine, sulphate	lb.	0	5	9	to	0	6	0
Benzoic acid	lb.	0	1	10	to	0	2	0
Benzoate of soda	lb.	0	1	9	to	0	1	11
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	4	9	to	0	5	0
Betanaphthol	lb.	0	1	9	to	0	2	0
Betanaphthylamine, technical	lb.	0	6	0	to	0	7	0
Croceine Acid, 100% basis	lb.	0	3	6	to	0	3	9
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	2	9	to	0	3	0
Dinitrobenzol	lb.	0	1	3	to	0	1	4
Dinitrochlorbenzol	lb.	0	0	10	to	0	1	0
Dinitronaphthaline	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	5	to	0	1	6
Dinitrophenol	lb.	0	2	9	to	0	3	0
Dimethylaniline	lb.	0	2	6	to	0	2	9
Diphenylamine	lb.	0	6	4	3 to	0	4	
H-Acid	lb.	0	6	6	to	0	7	0
Metaphenylenediamine	lb.	0	5	6	to	0	5	9
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	6	0	to	0	6	6
Monosulphonic Acid (2.7)	lb.	0	5	6	to	0	6	0
Naphthionic acid, crude	lb.	0	3	3	to	0	3	6
Naphthionate of Soda	lb.	0	3	3	to	0	3	6
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Nitronaphthalene	lb.	0	1	4	to	0	1	5
Nitrotoluol	lb.	0	1	0	to	0	1	2
Orthoamidophenol, base	lb.	0	10	0	to	0	10	5
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	1	6	to	0	1	9
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	10	0	to	0	10	6
Para-amidophenol, hydrochlor	lb.	0	10	6	to	0	11	0
Paradichlorbenzol	lb.	0	0	6	to	0	0	7
Paranitraniline	lb.	0	3	6	to	0	3	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	5	0	to	0	5	3
Paraphenylenediamine, distilled	lb.	0	11	0	to	0	11	6
Paratoluidine	lb.	0	7	0	to	0	7	6
Phthalic anhydride	lb.	0	2	9	to	0	3	0
Resorcin, technical	lb.	0	5	6	to	0	6	0
Resorcin, pure	lb.	0	6	9	to	0	7	0
Salol	lb.	0	2	3	to	0	2	6
Sulphanilic acid, crude	lb.	0	1	0	to	0	1	1
Tolidine, base	lb.	0	6	6	to	0	7	0
Tolidine, mixture	lb.	0	2	6	to	0	2	9

Potash

REPORTS from the shipping centres indicate that supplies of potash salts are coming forward regularly from Rotterdam and Antwerp. The increased demand for kainit and sylvinite has become more pronounced, as buyers are now particularly disposed to purchase those qualities which can be obtained at the lowest price per unit. With the approach of the planting season, there is also a general tendency to order for immediate delivery, direct from the ports. Current quotations for the best grades of potash are as follows:

Kainit	14%	(K_2O)	£2	12	6	f.o.r. in bags	
Sylvinite	20%	,,	£3	12	6	,,	,, ,,
Sylvinite	30%	,,	£5	12	6	,,	,, ,,
Muriate of potash	50%	,,	£10	10	0	,,	,, ,,
Sulphate of potash	90%	purity	£14	10	0	,,	,, ,,

It will be noted that these quotations are down to the pre-war basis. In view of the higher cost of production and the dearer freights prevailing, it seems not probable that lower quotations can be made, indeed, it is more likely that a rise will be indicated in the course of this year.

British Association Surplus Funds

IT was reported at the last meeting of the Edinburgh Committee of the British Association that the receipts had amounted to £3,039 and the expenditure to £1,654. It was agreed that the surplus of about £1,350 should be handed over to the University of Edinburgh to establish a fund the revenue from which shall be applied in providing grants for travelling and other authorised expenses to advanced students, preferably honours students, in the Faculty of Science of the University of Edinburgh to enable them to proceed to laboratories or museums away from Edinburgh for advanced study, or to localities which present opportunities for the study of material of scientific importance.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

GLASGOW, MARCH 1, 1922.

DURING the past week the demand for Industrial Chemicals has been on a moderate scale, with steady buying for day-to-day needs.

Alkali products were in rather less demand.

Shipping inquiries and orders have been decidedly scarcer.

Borax and Boracic Acid prices are cheaper, makers having advised reductions of £2 and £5 per ton., respectively.

Imports from the Continent have not been important.

In Coal Tar Products and Intermediates there is little of interest to report, except that there is more pressure to sell Benzol at a concession on recent prices.

Industrial Chemicals

ACETONE.—A quiet market with limited inquiries. The improvement in the American Exchange has brought out offers from America, and easier prices are indicated in the near future.

ACID ACETIC.—The market remains firm, and Glacial is quoted around £56 per ton, delivered.

ACID BORACIC.—Makers have advised a reduction of £5 per ton. Crystal or Granulated now quoted £60, and Powdered £62 per ton, minimum ton lots.

ACID CARBOLIC.—Quoted at 5¾d. to 6d. per lb. with little demand.

ACID MURIATIC.—Consumers are taking rather better deliveries, but the recent reduction in price has not caused any rush of orders, and the consumpt is still very low.

ACID SULPHURIC (Oleum 20 per cent.)—A few inquiries for home consumpt at the recent reductions. Price £8 to £8 10s. f.o.r. works, in buyers' tanks.

AMMONIA CARBONATE.—Very small inquiry. Quoted at 4d. to 4½d. per lb.

AMMONIA LIQUID, 880°.—A slight demand for small lots at 4d. to 4½d. per lb. delivered.

AMMONIA, MURIATE (Galvanisers).—Few inquiries for local consumpt. Price steady at £34 10s. per ton f.o.r.

ARSENIC, WHITE, POWDERED.—Small demand, and prices easier at about £42 per ton ex quay.

BARIUM CARBONATE, 98% PRECIPITATED.—Small inquiry, and price lower at £17 10s. per ton, f.o.r. works.

BARIUM CHLORIDE.—Continental quotations slightly dearer at £16 per ton c.i.f. U.K. Ports.

BLEACHING POWDER.—Home requirements still small, but material business done for export. Price unchanged at £14 to £15 per ton, ex station.

BORAX.—Reduced by £2 per ton. Crystal or Granulated £29 per ton, and Powdered £30 per ton, in minimum ton lots and up.

CALCIUM CARBIDE.—Now freely offered from the Continent at £13 10s. per ton f.o.b. Hamburg.

CALCIUM CHLORIDE.—Home product remains unchanged at £7 10s. per ton ex station. Cheap Continental offers at £5 15s. per ton c.i.f. U.K. Ports.

FORMALDEHYDE, 40% by volume.—Very poor inquiry and prices inclined to be lower. At £78 to £80 per ton ex wharf.

GLAUBER SALTS, desiccated.—Small inquiry for home consumpt, £12 5s. per ton delivered.

LEAD ACETATE.—Practically no inquiry. Continent offering at £38 to £39 per ton c.i.f. U.K. Ports.

LEAD, RED.—A further reduction in price. Makers quoting £34 10s. per ton ex station.

LEAD, WHITE.—Moderate business passing at £49 per ton ex station.

MAGNESIUM CHLORIDE.—A slight inquiry, but buyers apparently holding off for further reductions in price. Continental makers offering at £7 to £7 10s. per ton c.i.f. U.K. Ports.

POTASSIUM CAUSTIC.—88/92%, £34 per ton, spot delivery, ex store. Few inquiries and moderate business.

POTASSIUM NITRATE.—Home makers quoting £49 to £50 per ton, f.o.r. London. Cheap Continental quotations at £30 15s. per ton c.i.f. U.K. Ports. Steady business in small spot lots.

POTASSIUM CARBONATE.—88/92%, £27 10s. c.i.f. U.K. 96/98%, £30 c.i.f. U.K. A few inquiries and moderate business done.

SODIUM ACETATE.—Small inquiry for home trade. Price £26 to £28 per ton.

SODIUM BICARBONATE (Refined Crystals).—£11 10s. per ton ex station. Mineral Water quality, £10 10s. per ton.

SODIUM CARBONATE (Refined Alkali 58%).—No change in price and little inquiry. Spot lots £9 15s. per ton ex quay.

SODIUM CARBONATE (Soda Crystals).—Price unchanged at £6 10s. per ton, ex station, ton lots.

SODIUM CAUSTIC.—Home trade small, but considerable business done for export. 60 per cent. broken, spot lots £26 per ton ex station. 70/72 per cent, £23 per ton ex station. 76/77 per cent., £25 10s. per ton ex station. 98 per cent. powdered and flaked, £29 to £30 per ton ex station.

SODIUM HYPOSULPHITE.—Prices easier. "Pea" Crystals, kegs £19 per ton. Commercial in casks, £13 10s. per ton ex store.

SODIUM NITRATE.—Fair business passing at £15 to £15 10s. per ton.

SODIUM SULPHATE, 95 PER CENT (Saltcake).—Increasing demand for export. Price unchanged at £4 per ton, f.o.b., with limited supply.

SODIUM SULPHIDE, 60/62 PER CENT.—Small local demand for spot lots. Price £21 to £22 per ton ex station.

SULPHUR.—Government stocks of Thirds still available, at £4 5s. to £4 15d. per ton, according to quantity. Sicilian Rock Refined, £10 per ton, c.i.f. U.K.

STEARINE, WHITE.—124/6°, £55 per ton; 110/12°, £40 per ton. Small local demand.

WAX.—Paraffin: No change to record. Prices still nominal and business lagging. Some refined 140° disposed of ex Government stocks at easy prices. White Paraffin Scale, 118/20°: A few sales reported at 1¼d. per lb.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ANTHRANILIC ACID.—Small home inquiry. Price 10s. per lb. 100 per cent. basis, delivered.

BENZOL.—Prices easier, under pressure to sell forward. Pure offered at 2s. 7d. per gallon and 90's at 2s. 4d. per gallon, f.o.r. makers' works.

BETA NAPHTHOL.—Prices lower and nominal, on poor inquiry. Around 1s. 1d. per lb. ex warehouse.

CLEVES ACID.—Small export inquiry; offered at 4s. 4d. per lb. 100 per cent. basis, f.o.b. U.K.

CHROMOTROPE ACID.—A few inquiries for export. Price quoted, 13s. per lb. 100 per cent. basis, f.o.b. U.K.

DIMETHYLANILINE.—A few inquiries for export. Price 2s. 10d. f.o.b. U.K., drums included.

DINITRONAPHTHALENE.—A small inquiry for export. Price 1s. 4d. per lb. f.o.b. U.K.

DIPHENYLAMINE.—Some inquiry for export. Price 4s. 3d. per lb. f.o.b. U.K.

GAMMA ACID.—Small inquiry for home trade. Price 15s. per lb. 100 per cent. basis, delivered.

ORTHOCRESITINIC ACID.—Some inquiry for the home trade. Price 4s. per lb. delivered.

PARANITRANILINE.—Continent offering at low prices. Around 2s. per lb. f.o.b. Hamburg.

PARANITROPHENOL.—A few inquiries for home. 1s. 9½d. per lb. delivered, quoted.

PARAPHENYLENEDIAMINE.—Small export inquiry. 10s. per lb. f.o.b. U.K., quoted.

SALICYLIC ACID.—Prices lower and business small. Technical, 8½d. per lb.; Pure, 1s. 6d. per lb., f.o.r. works.

TOLUOL.—Supplies offered at lower prices; around 2s. 7d. per gallon, carriage paid, in buyers' tanks.

TOLUIDINE BASE.—Small export inquiry. Price 7s. per lb. 100 per cent. basis, f.o.b. U.K.

TOBIAS ACID.—Price lower, at 5s. 11d. per lb. carriage paid, for home trade.

German Chemical Trade Notes

FROM OUR OWN CORRESPONDENT.

Berlin, February 26, 1922.

THE railway strike has had heavy consequences; quotations for spot goods have advanced and consumers have been paying any price in order to cover their wants. Further price increases are anticipated owing to steadily increasing overhead costs, wages and an increase of 20 per cent. in freight rates as from March 1. Farmers are showing an increasing reluctance to purchase fertilisers. This is probably due in a large measure to the abnormal increase in prices during the last four months, The Benzol Verband continues to raise prices. Export trade is very slow. The market is still upset by sales of surplus war chemicals, fats, and drugs, which are offered at prices far below present market levels. The soap works generally are well occupied, but there are few new orders coming in.

The shortage of coal is one of the main features militating against a satisfactory development of the chemical industry; the Badische Anilin u. Sodafabrik Co. have been prospecting for coal and it is understood that several seams have been located in Middle Germany. The following quotations are given in marks per kilogram (d.=domestic price; e.=export price):

Acetic Acid, 80%, chemically pure, 29.50 mk. e.; glacial, 98/100%, 38 mk. e. Benzoic Acid, 65 mk. d., 70 mk. e. Boric Acid, 50 and 63.50 mk. d. Formic Acid, 50%, 14 mk. d.; 85%, 21.50 mk. d. Oxalic Acid, 98/100%, crystallised, 30 mk. d., 60 mk. e. Sulphuric Acid, 66°, 4.20 mk. d., 6 mk. e. Alum, Chrome, 22 mk. d., 28 mk. e.; Potash, in lumps, 9.50 mk. e.; Potash-crystal-powder, 9.50 mk. d., 10.50 mk. e. Alumina, Sulphate, 14/15%, 5.25 mk. e. Ammoniac, Sal, 98/100%, crystallised, 22 mk. d., 26 mk. e. Arsenic, white, 35 mk. d., 38 mk. e. Barium chloride, 9.50 mk. d., 11.50 mk. e. Bleaching Powder, 110/115%, 9.75 mk. e. Calcium Chloride, 70/75%, 3.75 mk. e.; 90/95%, 4.25 mk. e. Copperas, 2.30 mk. d., 4.50 mk. e. Copper Sulphate, 98/100%, 21/22.50 mk. d., 22/23 mk. e. Glauber's Salt, crystallised, 1.60 mk. d., 3.50 mk. e. Magnesium Chloride, fused, 2.50 mk. d., 5.50 mk. e. Potash Carbonate, 96/98%, 23 mk. d., 25.50 mk. e. Potash Caustic, 88/92%, 24.50 mk. d., 25.25 mk. e. Potash Caustic, liquor, 50°, 12.50 mk. d., 18 mk. e. Potash Chlorate, powdered, 23 mk. d., 24 and 26 mk. e. Potash Saltpetre, 15.10 mk. e. Sal Ammoniac Spirit, 13 mk. e. Salt Cake, 3 mk. d., 5.50 mk. e. Soda Crystals, 2.20 mk. d., 4.50 mk. e. Soda Ash, 8 mk. d.; 7.60 mk. e.; in brisk demand but no offerings. Soda Bicarbonate, 4.25 mk. d., 8.50 mk. e. Soda Caustic, 125/128°, 25 mk. d., 23 mk. e. Sodium Nitrate, refined, 9.50 mk. d. Sodium Silicate, 2.75 mk. d., 4.10 mk. e. Sodium sulphide, 30/32%, 8.25 mk. d., 11 mk. e.; 60/62%, 15 mk. d., 18.25 mk. e. Sulphur, in lumps, A1 quality, 8.70 mk. d. Zinc Chloride, 15.50 mk. e.

Increasing activity has been noted on the coal tar and coal tar products market, and further improvements are predicted. An increase in prices is expected in the near future. Quotations are as follow:

Benzaldehyde, 60 mk. d., 65 mk. e. Brown Coal Tar, 1.10 and 1.80 mk., according to quality. Naphthalene, pure, 10 mk. d., 13 mk. e.; in flakes, 12 mk. e. Paraffin Oil, 4 and 5 mk.; for best quality the demand is fair, only small supplies being to hand. Vaseline Oil, white, 23 mk. Tar Residues, 30 and 40 mk. per 100 kilos.; the demand has slackened and prices are likely to decline.

Paint materials were favoured products during last week. An increase in industrial activity would create a further increased demand for these goods. The present quotations are:

Red Lead, 29 mk. d., 30 mk. e. White Lead, powdered, 30 mk. d.; in oil, 29 mk. d. Sugar of Lead, crystallised, 27 and 28 mk. d., 33 mk. e. Litharge, pure, 28.20 mk. d. Lithopone, red-seal, has met with a better demand; spot lots were bought at 12 mk. d., 17 mk. e. Zinc-White, white seal, 29.80 mk. d.; green seal, 28.50 mk. d.; red seal, 27.30 mk. d., 34 mk. e.

Catalogue Received

PARTICULARS and statistics relating to the "Sphere" portable gas producers for motor lorries, stationary engines, &c., are issued by Economic Power, Ltd., of 110, Victoria Street, London, S.W. 1. This plant, which is manufactured by licence under the D. J. Smith patents, can, it is claimed, be fitted to any existing petrol engine driving a lorry without altering the engine in any way. According to the description the plant is automatically fed with fuel, while mechanism driven from the crankshaft cleans the fire automatically. Two pipes are slung under the body for cooling the gas, whilst a third pipe is used as a scrubber. The fuel cost is said to be equivalent to that of petrol at 4d. per gallon.

Producer Gas and Ammonia Recovery

AT a meeting of the Institution of Mechanical Engineers, held in Manchester recently, a paper by Messrs. H. S. Denny and N. V. S. Knibbs was read in which the authors described their investigations into the working of a Mond gas producer plant coupled up with gas engine plant. It comprised seven producers, each 10 ft. 6 in. diameter, and was designed to gasify 24 tons per day. Their object was to ascertain the merits of the principle of gasification of coal with ammonia recovery, and the conclusion they came to was that its profitable application was limited to cases in which the cost of the coal was low or the price of the by-product high. Under pre-war conditions, when producer slack was obtainable at 4s. to 5s. per ton, the producers were frequently worked solely for the recovery of the maximum amount of sulphate of ammonia, irrespective of the quality of the gas, and the average obtained was 76 lb., though sometimes 90 lb. was reached. When gas for power purposes was demanded and the producer was run at its full capacity there was a serious falling off in the yield of sulphate of ammonia. Their experience did not confirm the suggestion that good results could be obtained from low-grade coal unsuitable for other purposes, and the outlook for high prices of sulphate of ammonia was problematical in view of the projected synthetic ammonia plants. A discussion followed, in which Messrs. T. R. Wollaston, J. D. Paton, and Fielden took part.

Oil Shales

ONLY recently, when the demand for petroleum has so enormously increased and there seems to be a danger of exhaustion of supplies of natural oil, has attention been directed to other sources of supply, especially oil shales. These are shales rich in bituminous substances and yield oil and gas on distillation. Oil shales have been worked for the production of oil for a number of years in Scotland, France, and a few other countries, but lately deposits in the Kimmeridge Clay in England have been receiving attention, whilst those in Norfolk are under development. Much research has also been undertaken on the vast oil shale deposits in the United States, especially those of Utah, Colorado and Wyoming, those at De Beque, Colorado, being actively developed.

Interesting information on the subject of this source of oil is given in a volume entitled "Oil Shales," by H. B. Cronshaw (John Murray, 5s.), recently issued in the series of monographs produced under the direction of the Mineral Resources Committee of the Imperial Institute. The monograph first describes oil shale and the similar material torbanite; the mining and distillation of oil shale; and the composition and properties of shale-oil. Descriptions follow of deposits of oil shale and torbanite in various parts of the British Empire, including those in the Utrecht district of Natal, Wakkerstroom district of the Transvaal, Albert County in New Brunswick, Pictou County in Nova Scotia, Blue Mountains in New South Wales and Mersey district in Tasmania. Accounts of foreign deposits are given next and include those of the United States, France, Bulgaria, and Brazil. A map showing the oil shale deposits of the world and a bibliography conclude the volume.

Indian Importation of Mineral Oils

APART from the enormous production in Burma, India imports very large quantities of mineral oils from overseas, and although these are not directly supplied by the United Kingdom, with the exception of the supplies from the Standard Oil Co. of New York and its associated concerns they are largely British controlled, states H.M. Senior Trade Commissioner in India and Ceylon, in his General Review of the Conditions and Prospects of British Trade in India (published for the Department of Overseas Trade by H.M. Stationery Office, price 5s. net). The most important item in the import oil trade is kerosene, the imports of which for the years 1920–21 and 1919–20 amounted to £4,307,298 and £6,623,422 respectively. The Standard Oil Co. of New York maintain their position as the leading importers, but the Asiatic Petroleum Co., Ltd., are competing more and more. The most striking feature of the trade is the increase in the imports from the Anglo-Persian Oil Co.'s valuable field in Southern Persia.

Company News

BRADFORD DYERS' ASSOCIATION.—The transfer registers in respect of the ordinary shares were closed on Tuesday, and will remain closed until March.

UNITED TURKEY RED.—The directors announce that they do not recommend a dividend on the ordinary shares for the past year. For 1920 the ordinary shares received 10 per cent.

RADIUM ORE MINES.—The report to August 31 last states that a period of great difficulty has been tided over. Work on the mine is now in full swing. The annual meeting was held yesterday (Friday) at the Institute of Chartered Accountants, London.

HORACE CORY & Co., LTD.—Speaking on February 23, at the annual meeting, Mr. J. W. Salisbury (the chairman) said they might congratulate themselves upon the fact that they were receiving a dividend of 6 per cent. in view of the general depression in trade.

COURTAULDS, LTD.—The disposable profit for 1921 amounts to £1,684,593, which, with £383,874 brought in, makes a total of £2,068,467. The directors recommend a final dividend for the year of 1s. 3d. per share, free of tax, making 11¼ per cent. for the year; £300,000 is added to general reserve and £418,467 is carried forward. The dividend is payable on March 13.

BRITISH BURMAH PETROLEUM CO., LTD.—Definitive certificates in respect of the issue of 8½ per cent. second mortgage debenture stock of the British Burmah Petroleum Co., Ltd., are now being issued in exchange for fully-paid scrip certificates to bearer. Forms for making the exchange can be obtained upon application to the Registrar, 5, Queen Street Place, London, E.C. 4.

ANTRIM IRON ORE.—The accounts for 1921 show a balance of £3,945, including the balance brought in, and after providing for working expenses, depreciation, and an interim dividend of 2s. per share, less tax. A further dividend of 2s. per share is announced, making 10 per cent. for the year, leaving to be carried forward £2,055. The total export of ore was 5,250 tons, compared with 24,675 tons in 1920.

VICKERS, LTD.—The directors announce the following final dividends for the half-year to December 31 last:—2½ per cent. on the preferred 5 per cent. stock, less tax; 2½ per cent. on the 5 per cent. preference shares, less tax; and 2½ per cent. on the cumulative preference shares, free of tax up to 6s. in the £, payable on March 30 to holders on the books at March 18. The transfer books relating to these issues will be closed from March 20 to 25 inclusive.

BORAX CONSOLIDATED, LTD.—The report to September 30 last states that the profits, after providing for management and administration expenses, are £378,965. Debenture interest, the interim dividends on the preference shares and on the preferred ordinary shares, amounted to £126,392, leaving, with the amount brought in, a sum to be dealt with of £372,213. To buildings, plant, &c., depreciation reserve account, there has been placed £40,000; to debenture stock redemption sinking fund, annual premium of £5,825; leaving £326,388, out of which final dividends were paid in November last on preference shares, £22,000, and on preferred ordinary shares, £18,000; the interim dividend on deferred ordinary shares, paid in November last, amounted to £57,500; leaving £228,888. From this balance the directors propose to pay a final dividend of 1s. 6d. per share on deferred ordinary shares, making 12½ per cent. for year, £86,250; to income-tax reserve, £20,000; to pensions and grants fund, £5,000; and to carry forward £117,638. The annual meeting will be held at the Cannon Street Hotel, London, on March 7, at noon.

Reopening of Lead Mines

THE Threlkeld lead mines of Cumberland are to be reopened after standing idle for twelve months. So acute has unemployment become that the miners are willing to restart on any terms of pay. The difficulties of working the mines are accentuated by the fact that the zinc concentrates cannot be produced except at a loss compared with the price at which the Government is selling the Australian concentrates. In this connexion, Mr. A. Wilson, chairman of the Lead and Zinc Mineowners' Association, informed a Press representative that the Government would probably lose about £601,000 for the year ending March next. The loss next year might, he thought, approach £1,200,000.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIALS.	REF. No.
Canada	Oxide of tin, granulated borax, sal-ammoniac, soda ash, &c...	235
"	Fine or heavy chemicals, drugs..	239
Finland	Dry kilns, presses, fans, &c.	247
Sweden.....	Crude soya bean oil, soap-making oils, &c.	257
United States of America.	Industrial chemicals, especially soda ash, caustic soda, and all chemicals of a sodium, potassium, lime and barium base; cyanides, paint pigments, earth colours, pottery clays, linseed oil, oxides and chemicals used by the rubber industries.....	263

Tariff Changes

BRAZIL.—Mineral oils are among the products affected by Tariff modifications introduced by the new Budget Law. New rates of duty for various oils and for carbide of calcium were published in the Board of Trade *Journal* (February 9, p. 163).

FEDERATED MALAY STATES.—Revised import duties on matches, varying according to the number of matches contained in a box, are now in force. Revised export duties on tin, tin ore, tin slag, and hard-head of tin are imposed as from January 1.

GAMBIA.—New regulations regarding the importation of petroleum provide, *inter alia*, that no "dangerous petroleum" (having a flash point below 76°F.) shall be imported unless contained in strong vessels so constructed as not to be likely to be broken or to become defective in handling or to allow the petroleum to escape, or in tins securely packed in wooden cases, and that such vessels shall be painted red, and the cases (if any) in which they are packed shall be plainly marked with the name of their contents.

KENYA.—As from January 1 an import-tax at the rate of 12½ cents per gallon is imposed on all petroleum having a flash-point below 76°F.

GERMANY.—As from February 20 the following goods may be imported without licence:—certain animal residues for fertilising purposes; dextrine; all kinds of fermentable sugar; vinegar; and yeasts, other than winelees.

ITALY.—The price fixed for the second half of February for certificates for payment of customs duties is 411 lire for 100 lire gold.

LATVIA.—Revised export duties, in most cases lower than those previously in force, became operative on February 7. Information as to the rates on any particular classes of goods may be obtained from the Tariff Section of the Department of Overseas Trade.

PARAGUAY.—The export duty on quebracho extract has been reduced from $3 to $1.50 (gold) per metric ton.

SWITZERLAND.—A revised general tariff, dated February 22, increases the rates previously in force. It will be applied to products coming from countries which subject Swiss goods to particularly high duties, or which treat such goods less favourably than those of other countries.

Affairs of Solomia, Ltd.

AT a meeting of creditors of Solomia, Ltd., insecticide manufacturers, of Fleet Street, London, held on Tuesday at 31-32, Broad Street Avenue, London, a statement of affairs was submitted showing a total deficiency of £9,280. The liabilities were shown—capital, £8,650; and creditors, £1,694. A resolution was passed confirming the voluntary liquidation of the company for purposes of reconstruction, with Mr. J. Trustham as liquidator. It was said that under this arrangement it was hoped that creditors would receive 10s. in the £.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette

Notice of Intended Dividend

VINE, Joseph (trading as THE TOILET SUPPLY CO.), 222 and 224, Harrow Road, London, manufacturer of toilet preparations. Last day for receiving proofs, March 14. Trustee, H. W. Buckingham, 24-27, Rood Lane, London, E.C.

Winding-up Petitions

ALBY UNITED CARBIDE FACTORIES, LTD. A petition for winding-up has been presented by this company, and is to be heard at the Royal Courts of Justice, London, on Tuesday, March 7. Slaughter & May, 18, Austin Friars, London, E.C., solicitors for the petitioners.

TURNERS GLASSWORKS CO., LTD. A petition for the winding-up of the company has been presented by Sturtevant Engineering Co., Ltd., creditors, and is to be heard at the Royal Courts of Justice, London, on March 7. Mills & Morley, 38, Lincoln's Inn Fields, W.C. 2, solicitors for the petitioners.

VEGETABLE OIL & LARD COMPOUND REFINERS, LTD. A petition for the winding-up of the company has been presented by J. E. Musker, a creditor, and is to be heard at the Royal Courts of Justice, London, on March 7. Blundell, Baker, & Co., 16, Sergeants' Inn, Fleet Street, E.C., agents for Snowball, Kyffin-Taylor, & Co., Liverpool, solicitors for the petitioner.

Company Winding Up

RUSSELL OIL & CHEMICAL CO., LTD., York Works, Short Road, Stratford, E. 15. Winding up order, February 21.

Companies Winding Up Voluntarily

GORDON, H. LTD. A. E. Tilley, 8, Staple Inn, Holborn, London, W.C. 1, appointed voluntary liquidator. Meeting of creditors at the liquidator's office, on Friday, March 10, at 2.30 p.m.

SAVANNAH CHEMICAL CO., LTD. P. Woodthorpe, Leadenhall Buildings, 1, Leadenhall Street, E.C.3, appointed liquidator. Meeting of creditors at the office of the liquidator on Thursday, March 9 at 3 p.m. Particulars of claims by April 10, to the liquidator.

SPRING VALE MANUFACTURING CO., LTD. F. Beattie, of 3, York Street, Manchester, appointed liquidator. Meeting of creditors at the office of the liquidator, on Friday, March 3, at 11 a.m. NOTE.—This meeting is a formal meeting, held to comply with the provisions of section 188 of the Companies (Consolidation) Act, 1908. All creditors have been or will be paid in full. Particulars of claims by March 30 to the liquidator.

ZINC OXIDE, LTD. W. V. Lyon, 2, Knighton Villas, Station Road, Harlington, Middlesex, appointed liquidator. Meeting of creditors at the offices of the company, Station Road, Hayes, Middlesex, on Wednesday, March 8, at 12 noon.

Liquidator's Notice

HENRY ASHWELL & CO., LTD. (in voluntary liquidation). Particulars of claims by March 21 to A. E. Roe, 18, Low Pavement, Nottingham, the liquidator.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BRITISH CASEIN CO. (1911) LTD., 24, Great Dover Street, chemists. £22 17s. 4d. December 15.

COWLEY, WILLIAM, & CO., 5 Cathedral Yard, Manchester, chemical manufacturers. £10 12s. 4d. December 30.

HEADLAND & CO., 68, Fulham Road, chemists. £16 9s. 11. December 8.

LENGS DRUG STORES, 205, High Street, Acton, chemists. £11 0s. 7d. December 8.

NASH (F. J.), LTD., Cambrian Mills, Newtown, wholesale chemists. £25 13s. 6d. December 20.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, created after July 1, 1908, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges which would, if created after July 1, 1908, require registration. The following Mortgages and Charges have been so registered. In each case the total debt, as specified, in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced since such date.]*

NICHOLSONS (NEWCASTLE-ON-TYNE), LTD., chemical manufacturers.—Registered February 15, £6,000 debentures; general charge. *£15,000. November 16, 1921.

Deeds of Assignment

BURNS, John, Harris, High Street, Highley, chemist. Filed, February 24. Trustee, P. S. Booth, 14-17, Holborn Viaduct, London, W.C. accountant. Secured creditors, £45; liabilities unsecured, £1,060; assets, less secured claims, £315.

WARDLE, Arthur Hampton, 9, Bloomsbury Street, W.C., qualified chemist. Filed, February 23. Trustee, P. S. Booth, 14-17, Holborn Viaduct, E.C. accountant. Liabilities unsecured, £1,386; assets, less secured claims, £1,914.

Receivership

COMMERCIAL GLASS WORKS, LTD. C. W. S. Temple, of 9, Pancras Lane, Queen Street, E.C. 4, was appointed receiver and manager on February 13, 1922, under powers contained in debenture dated September 1, 1921.

New Companies Registered

BAYLISS, BALCON & CO., LTD., Warwick Chambers, Corporation Street, Birmingham, manufacturers of and dealers in oils, colours, paints, varnishes, grease, &c. Nominal capital: £1,200 in £1 shares.

WILLIAM BAYNTON, LTD., manufacturers of fertilisers, guano, oil, glue, soap, tallow, &c. Nominal capital: £1,000 in £1 shares. A director: W. Baynton, 60, Welholme Road, Grimsby.

BURTON, BAKER & CO., LTD., 16, Eastcheap, London, manufacturers of, and wholesale dealers in, boracite, borax, boracic acid, and any similar ore, &c. Nominal capital: £25,000 in £1 shares.

FYLDE OIL & RUBBER CO., LTD., 1, Preston Street, Fleetwood, manufacturers of, and dealers in, benzol, petrol, and grease, fat and chemical merchants, manufacturers of rubber substitutes, balata, gutta-percha, &c. Nominal capital: £2,000 in £1 shares.

HAFED OIL & GREASE CO., LTD., 17, Wind Street, Swansea, chemists, drysalters, oil, grease, and colourmen, &c. Nominal capital: £1,000 in £1 shares.

HELD GLUE & COMPOUNDS CO., LTD., 9-11, Richmond Road, Twickenham, Middlesex. Glue and varnish manufacturers, &c. Nominal capital: £1,000 in 1,000 deferred shares of 1s. each, and 950 preference shares of £1 each.

SCIENTIFIC PRODUCTS, LTD, 72, Coombe Lane, Wimbledon, London. Research and manufacturing chemists, technologists, manufacturers of agglutinants, chemical dry-cleaning preparations, liquid glues, chemicals and drugs, &c. Nominal capital: £3,000 in £1 shares.

SPARTH SOAP CO., LTD., Sparth Soap Works, Sparth Road, Clayton-le-Moors, Lancs. Soap manufacturers and oil and tallow refiners. Nominal capital: £3,000 in £1 shares.

Recent Wills

Sir William Henry Tate, chairman of Henry Tate & Sons, Ltd. £1,114,108

Mr. George Herbert Bramwell, of Ravenshoe, St. Helens, chemical manufacturer £8,847